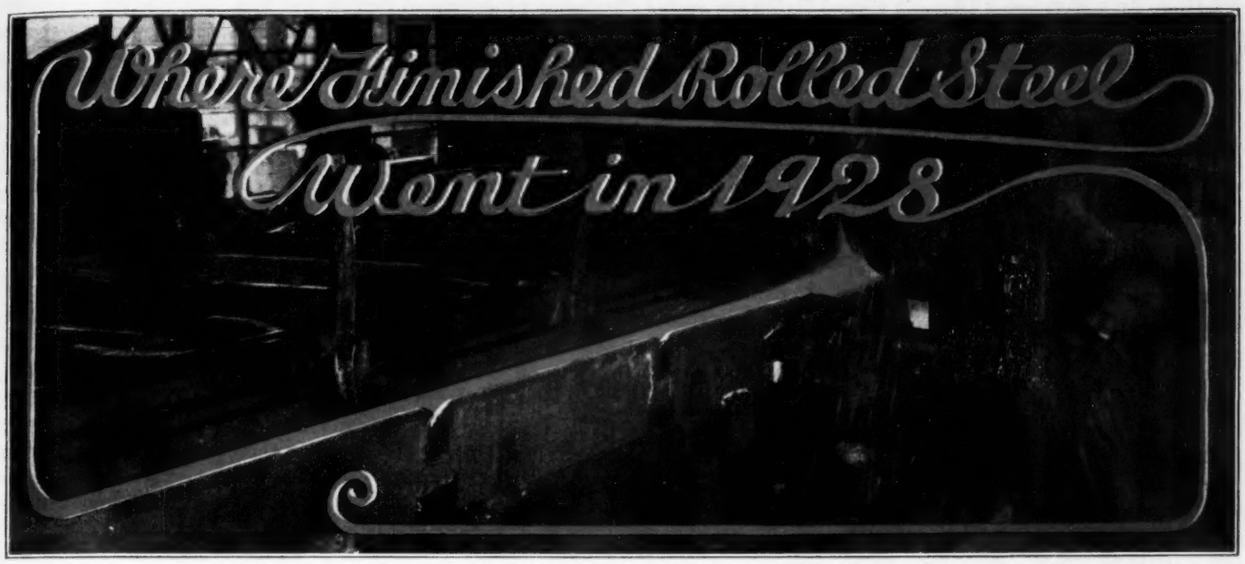
Volume 84
Number 7

IRON TRADE REVIEW

Cleveland, O.
Feb. 14, 1929



UNTIL 1922, when IRON TRADE REVIEW inaugurated the first statistics of the distribution of finished rolled steel, the industry had practically no information on the consumption of its products. Each year since that time, the annual compilations have been improved and refinements have been added. Now by virtue of these seven annual reports, the industry has available a reliable guide to the trends of steel consumption. Today we have a clearer conception than ever before of "where the steel goes." Obviously, the value of these statistics lies in their interpretation and use. Recognizing this fact, IRON TRADE REVIEW has studied its report for 1928 with a view of presenting in this and future issues information supplementary to the preliminary figures published on pages 40-43 of the Jan. 3, 1929, issue. It is believed this discussion not only will open new avenues for the application of the data on distribution, but will reveal significant points that heretofore have not been apparent to readers.

At the outset it should be emphasized that IRON TRADE REVIEW'S figures represent the distribution of *finished rolled iron and steel.* This fact should be remembered by readers attempting to reconcile the distributed tonnages with the production tonnages reported by the American Iron and Steel institute. The accompanying table will assist in clarifying this point. The steel ingot production for 1928 as reported by the institute was 49,857,223 tons. About 350,-

How Steel Ingots Shrink

			Gross tonnage
Steel ingot production, 1928			49,857,223
Ingots to forgings direct		350,000	
Loss in conversion of ingots to semi-finished steel, 20 per cent		9,901,444	10,251,444
Semifinished steel production			39,605,779
Loss in conversion, semifinished to finished steel, 10 per cent			3,960,578
Total finished rolled iron and steel			35,645,201
Distribution—Industry:	% of Total	Tonnage	
Automotive	17.76	6,330,588	
Railroads	17.02	6,066,813	
Buildings	15.22	5,425,200	
Oil, water and gas	7.72	2,751,809	
Exports	5.52	1,967,615	
All other	36.76	13,103,176	
Totals	100.00	35,645,201	35,645,201

Consumption Ratios of Main Groups

	1922	1923	1924	1925	1926	1927	1928
Railroads	24.96	31.02	27.54	22.26	22.81	20.37	17.02
Buildings	11.83	13.53	14.44	15.26	13.10	14.89	15.22
Automotive	14.84	10.59	11.37	14.60	15.09	13.34	17.76
Oil, gas and water	8.93	10.60	8.43	8.03	9.29	8.90	7.72
Export	7.83	6.22	5.89	4.47	5.29	5.39	5.52
All other	31.56	28.04	32.33	35.36	34.42	37.11	36.76

000 tons of ingots went directly into forgings. Of the remaining 49,507,223 tons of ingots, an estimated 20 per cent or 9,901,444 tons represented the loss in conversion to semifinished steel. This gives a production of semifinished material of 39,605,779 tons.

The loss in converting semifinished to finished rolled steel varies between wide limits, according to product, but assuming an average of 10 per cent and deducting it, we arrive at 35,645,201 as the calculated tonnage of finished rolled steel.

As a check against this figure we can take the American Iron and Steel institute's ingot figures for 1927 and 1928, and the "finished rolled iron and steel" (as used by the institute) for 1927, and by proportion calculate the "finished rolled iron and steel" for 1928 to be 37,400,000 gross tons. However, note that in this figure are roughly 350,000 tons of rolled forging blooms and billets; about 550,000 tons of rolled *iron* products; and large tonnages of wire rods and skelp. Based on ratios obtaining in previous years, we can account for a conversion loss of roughly 750,000 tons in 1928 for skelp and wire rods. Deducting this, together with the iron and forging blooms and billets, from the 37,400,000 tons, we arrive at 35,745,000 as the calculated tonnage of rolled steel—a tonnage that theoretically should check with the 35,645,201 tons calculated from the ingot production. Considering the chance for errors in the numerous assumptions made in calculation, the difference in the two figures is surprisingly small. At any rate, in the absence of actual facts, we are warranted in using 35,645,201 tons as the arbitrary total for *finished rolled steel.*

* * *

Is Largest Distributed Tonnage

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AS SHOWN on the table on page 453, IRON TRADE REVIEW'S total tonnage of finished rolled steel for which detailed distribution is shown, is 31,751,186 tons. This is the largest annual tonnage ever reported for which detailed distribution is shown. It represents actual tonnage reported by approximately 100 companies and does not include estimates for the companies that failed to report.

Steel producers reported 3,864,000 tons of semifinished material sold to others for rolling. Applying the estimated conversion loss of 10 per cent we find that this semifinished material represents a finished tonnage of 3,477,600.

IRON TRADE REVIEW was successful in tracing the destination of 1,735,000 tons or approximately half of this tonnage. This was accomplished by means of reports from mills which purchase their semifinished material. There remains, however, a total of 1,742,600 tons for which no distribution figures are available. Thus IRON TRADE REVIEW accounts for 33,493,786 tons of the 35,645,201 tons calculated from the ingot production. The discrepancy represents the tonnage for which reports were not received, and also covers a number of minor inconsistencies. For instance

Percentage of Products to Consuming Groups

	Heavy rails	Light rails	Angle bars, track accessories	Plates	Structural shapes	Bars and shapes under 3-inch	Concrete bars	Hoops, bands, cotton ties	Black plates for tinning	All other sheets, excepting galvanized	Galvanized sheets	Tubing and pipe	Wire products	Strip steel
1—Railroads														
a Cars and locomotives	....	0.01	....	19.30	6.96	5.02	....	0.91	....	4.30	4.00	1.17	0.75	1.11
b Track construction, repair	90.85	1.51	92.87	0.49	0.07	1.12	0.37	0.03	....	....	....	0.01	0.98	....
c Buildings and bridges	....	0.03	....	4.33	8.03	3.48	3.85	0.16	....	0.44	0.34	0.02	0.26	....
2—Buildings														
a Erection materials—framework—trim—etc	0.10	2.69	0.03	19.29	55.10	6.14	54.41	3.77	0.30	2.46	18.69	4.37	4.99	5.58
b Furnishings	....	....	....	2.37	0.01	0.65	....	4.16	0.04	9.50	4.32	0.35	2.19	2.37
c Other pressed metal products for buildings	....	....	....	0.33	0.65	0.72	....	1.60	....	1.59	1.53	0.06	1.99	1.29
3—Highways, highway bridges	....	....	....	0.16	0.92	0.22	32.11	....	....	0.24	7.33	0.08	0.52	....
4—Automotive	....	....	0.01	6.10	0.88	33.44	....	50.37	1.66	43.35	0.60	2.35	8.47	58.74
5—Oil, gas and water	0.04	1.34	0.08	17.07	2.67	1.60	....	2.38	2.69	2.90	2.71	46.58	1.13	0.12
6—Mining and lumbering	0.66	74.99	1.69	0.48	0.50	0.60	....	1.72	....	0.18	0.47	0.49	0.71	0.06
7—Agricultural	0.04	0.10	0.02	3.36	0.87	16.48	0.22	10.50	....	1.43	4.07	0.24	28.68	2.34
8—Shipbuilding	....	....	0.01	2.66	1.03	0.50	....	0.07	....	0.20	0.11	0.17	0.10	....
9—Machinery, tools, equipment	0.02	1.27	....	3.19	2.42	8.31	....	2.34	....	5.40	3.18	2.70	1.19	2.22
10—Food and packing industry	....	....	....	0.15	0.05	0.14	....	6.79	67.39	4.72	0.80	0.02	1.31	0.80
11—Exports	6.65	9.08	2.81	6.91	5.12	2.62	0.92	2.05	19.00	2.47	12.34	5.95	5.77	0.64
12—Miscellaneous	1.58	3.15	0.91	7.07	4.15	10.04	0.62	7.88	4.88	13.60	11.65	4.87	20.40	22.04
Jobbers	0.06	5.83	1.57	6.74	10.57	8.92	7.50	5.27	4.04	7.22	27.86	30.57	20.56	2.69
Grand totals	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

IRON TRADE REVIEW'S distributed tonnage includes an undetermined tonnage of rolled iron. To make due allowance for the various minor conflicts in the statistics would introduce complications and add little if anything to accuracy.

From the above explanation it can be understood readily that there is no duplication in the figures. On the basis of actual distribution of 31,751,186 tons, we have computed in the table on page 451 the distribution of the calculated total of 35,645,201 tons. This affords the best indication possible of the distribution of finished rolled iron and steel to the major consuming groups.

* * *

Auto Industry Leads

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THE outstanding feature of the 1928 distribution figures is the rise of the automotive industry to a front rank position in the consumption of steel. According to reports actually received, the automotive industry in 1928 required 5,640,509 tons of steel and the railroads 5,404,101 tons. However, if we assume the unreported tonnage to be distributed similarly to that which was reported, we determine the total finished rolled iron and steel going to the automotive industry in 1928 to be 6,330,588 tons. In the same manner we arrive at 6,066,813 tons as the total consumption of the railroads. Thus for the first time in history the automobile industry has forged ahead of the railroads, which for years have enjoyed undisputed leadership in the consumption of steel. It is significant that 1928 was a near-record year in the production of automobiles and motor trucks.

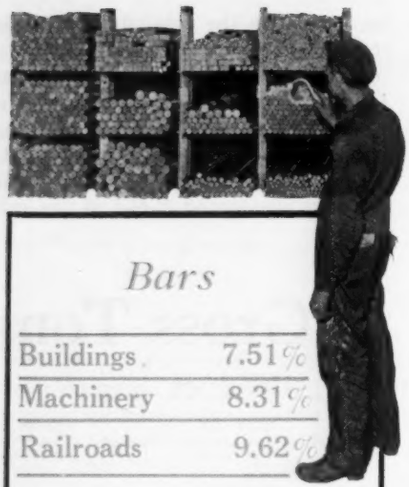
By using the ratios shown at the top of page 452, and applying them

Distribution of Finished Steel in Gross Tons

Shown by Consuming Group and Individual Product

	Heavy rails	Light rails	Angle bars, steel ties and other track accessories	Plates	Structural shapes	Bars and shapes 3-inch, cepting crete	under ex- con- bars	Concrete bars	Hoops, bands, and cotton ties
1—Railroads									
a Cars and locomotives	66	15	40	616,204	228,522	292,995	.....		8,363
b Track construction and repair	2,184,528	1,602	848,818	15,624	2,351	65,648		2,500	252
c Buildings and bridges	120	36	5	138,297	264,063	203,254		25,784	1,504
2—Buildings	.....	.....	.....	.....	.....	.....		.....	.....
a Erection materials–framework–trim–etc.	2,268	2,858	239	615,451	1,811,169	357,945		365,472	34,673
b Furnishings–metal furniture–stoves–refrigerators–etc	.....	.....	.....	75,492	483	38,802		.....	38,264
c Other pressed metal products for buildings	.....	.....	.....	10,673	21,242	42,210		.....	14,765
3—Highways and highway bridges	.....	.....	.....	5,060	30,565	12,800		215,695	.....
4—Automotive	77	4	101	194,852	29,027	1,941,072		.....	463,638
5—Oil, gas and water	826	1,419	837	544,890	87,451	92,979		.....	21,930
6—Mining and lumbering	15,936	79,684	15,417	15,440	16,587	34,824		1,500	15,785
7—Agricultural	940	104	149	107,253	28,735	959,771		.....	96,652
8—Shipbuilding	3	2	.....	84,821	33,972	28,996		.....	676
9—Machinery, tools and equipment (including electrical)	594	1,354	134	101,750	79,867	484,348		.....	21,560
10—Food and packing industry	.....	.....	.....	4,633	1,470	8,541		.....	62,519
11—Exports	159,953	9,655	25,646	220,484	168,386	152,240		6,187	18,824
12—Miscellaneous	37,734	3,349	8,280	225,769	136,530	584,566		4,158	72,516
Totals	2,403,045	100,082	899,666	2,976,693	2,940,420	5,300,991		621,296	871,921
Jobbers	1,419	6,197	14,345	215,274	347,152	519,279		50,352	48,466
Grand totals	2,404,464	106,279	914,011	3,191,967	3,287,572	5,820,270		671,648	920,387

	Black plates for tinning	All other black plate and sheets, excepting galvanized sheets	Galvanized sheets	Tubing and pipe	Wire products	Strip steel	All other finished steel products	Grand Totals, all finished products	Per Cent of Total
1—Railroads									
a Cars and locomotives	2	164,322	50,894	36,589	17,187	18,688	126,302	1,560,189	4.91
b Track construction and repair	.....	.....	.....	406	22,018	.....	18,060	3,161,807	9.96
c Buildings and bridges	.....	16,894	4,380	783	5,989	10	20,986	682,105	2.15
2—Buildings	.....	.....	.....	.....	.....	.....	.....	.....	.....
a Erection materials–frame-work–trim–etc	4,970	94,444	238,181	137,021	113,263	94,075	40,189	3,912,218	12.32
b Furnishings – metal furniture – stoves–refrigerators–etc	577	363,156	55,104	11,034	49,432	39,909	3,000	675,253	2.13
c Other pressed metal products for buildings	.....	61,199	19,457	1,931	45,227	21,750	5,165	243,619	0.77
3—Highways and highway bridges	.....	9,418	93,387	2,657	11,900	.....	9,940	391,422	1.23
4—Automotive	27,205	1,657,940	7,658	73,689	191,753	989,690	63,803	5,640,509	17.76
5—Oil, gas and water	43,907	110,890	34,567	1,462,189	25,614	2,000	22,700	2,452,199	7.72
6—Mining and lumbering	.....	7,374	5,987	15,427	16,109	1,073	13,132	254,275	0.80
7—Agricultural	.....	54,917	51,983	7,388	650,201	39,391	16,719	2,014,203	6.34
8—Shipbuilding	.....	7,591	1,420	5,414	2,311	.....	3,230	168,436	0.53
9—Machinery, tools and equipment (including electrical)	2	206,543	40,572	84,876	26,973	37,295	18,858	1,104,726	3.48
10—Food and packing industry	1,102,049	180,366	9,834	608	29,681	13,536	33,588	1,446,825	4.56
11—Exports	310,917	94,435	157,330	186,535	130,940	10,724	101,317	1,753,573	5.52
12—Miscellaneous	79,716	520,119	148,592	152,931	462,588	371,358	59,940	2,868,146	9.03
Totals	1,569,345	3,549,608	919,346	2,179,478	1,801,186	1,639,499	556,929	28,329,505	.....
Jobbers	66,218	275,992	355,129	959,597	466,190	45,368	51,703	3,422,681	10.78
Grand totals	1,635,563	3,824,600	1,274,475	3,139,075	2,267,376	1,684,867	608,632	31,751,186	100.00



Bars

Buildings	7.51%
Machinery	8.31%
Railroads	9.62%
Agriculture	16.48%
Automotive	33.44%

to the known totals of finished rolled iron and steel since 1922, we develop the following interesting table on the total consumption by these two important consuming groups:

	Automotive	Railroad
1922	2,214,164	6,152,290
1923	3,303,106	9,675,388
1924	3,009,673	7,289,920
1925	4,629,259	7,064,376
1926	5,101,431	7,711,309
1927	4,192,722	6,402,230
1928	6,330,588	6,066,813

It will be noted that except for a few fluctuations the trend of railroad consumption is steadily downward, whereas that for the automotive industry rises sharply. Whether future history will show that 1928 marks the point at which the consumption lines of the two industries cross is problematical, but it is evident that the position of the automotive industry as a tonnage consumer appears much more impressive than that of the railroads.

The growing importance of the automotive industry as a consumer of steel is of deeper significance, however, than in a bare comparison of total tonnages required. Whereas the railroads have been closely identified with the upbuilding of the steel industry in preceding decades, their principal contribution has been in the form of steel rails. Even in the past several years, heavy rails and track accessories have constituted from 40 to 55 per cent of total steel requirements of the railroads.

Contrasted to that picture, is the broadening influence of the automotive industry. It is credited as being responsible for the creation of strip steel and full finished steel sheets; is recognized as the developer of seamless steel tubing; and has stimulated many developments in cold drawn and cold-rolled steel. Consequently, the increase in demand of the automotive industry in the past several years by several million tons annually, has been reflected throughout all phases of the industry, from the production mill to the fine wire drawing benches.

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Building Consumption Is High

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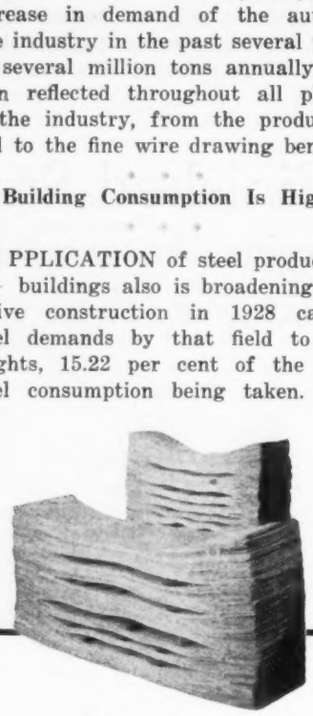
APPLICATION of steel products to buildings also is broadening. The active construction in 1928 carried steel demands by that field to new heights, 15.22 per cent of the total steel consumption being taken. This



Sheets

Railroads	4.74%
Machinery	5.40%
Jobbers	7.22%
Buildings	13.55%
Automotive	43.35%

is the greatest proportion in any of the seven years excepting 1925, and exceeds in tonnage all previous years.

Oil, gas and water industries in 1928 reflected instability. Curtailed drilling operations were an influence on the purchase of seamless steel tubing. These industries required 7.22 per cent of all steel in 1928, the smallest proportion in the seven years. The high point was in 1922 when 14.84 per cent was consumed.

To more clearly depict the part that warehouses and jobbers play in the distribution of steel, the data have been altered this year, placing this classification in sharper relief from the actual consuming industries. Other changes in the master table of shipments include the combining of street railways and steam railroads under one heading, and the establishment of a major building classification with three subdivisions, erection materials, framework, trim, etc.; furnishings, metal furniture, stoves, refrigerators, etc., and other pressed metal products for buildings.

Directly traceable to the record breaking consumption of steel by the automotive industry is the decided gain in steel bar tonnage for 1928. In that year a total of 5,820,270 tons of steel bars and shapes under 3-inch were shipped, compared with 4,670,714 tons in 1927. The gain was attributable almost entirely to automotive increases, consumption by that industry gaining from 1,315,594 to 1,941,072 tons.

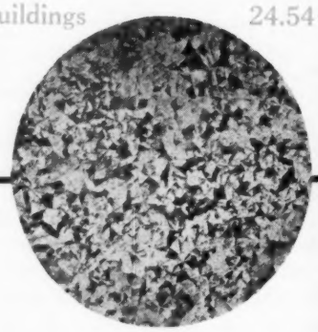
Improvement in the agricultural industry, expressed through unusually heavy purchases of equipment, was reflected in an increase in steel bar tonnage from 579,414 tons in 1927 to 959,771 tons in 1928.

The largest proportionate increase in tonnage by any one product was in strip steel. This gain also was largely due to increased automotive demand. Whereas 477,437 tons of a total of 940,137 tons in 1927 went to the automotive group, 989,690 tons of 1,684,867 tons was distributed there in 1928. The only other material increase in strip steel consumption was in the miscellaneous classification. This increased from 203,520 to 371,358 tons in the 1927-28 period and indicates the expanding uses of strip steel.

Automotive impetus carried hoop,

Galvanized Sheets

Agriculture	4.07%
Railroads	4.34%
Highways	7.33%
Exports	12.34%
Buildings	24.54%



band and cotton tie demand in 1928 above 1927, the totals being 920,387 and 648,313 tons. A gain of almost 50 per cent in consumption of sheets by the automotive industry accounted for almost 70 per cent of the gain in that product over 1927.

Products relying almost entirely upon the railroad field for their demand registered decreases in 1928. Heavy rail consumption dropped approximately 150,000 tons, light rails, 27,000 tons, and angle bars, steel ties and other track accessories, about 19,000 tons. Decreased activity in car and locomotive construction and repair was a factor in plate consumption also during 1928.

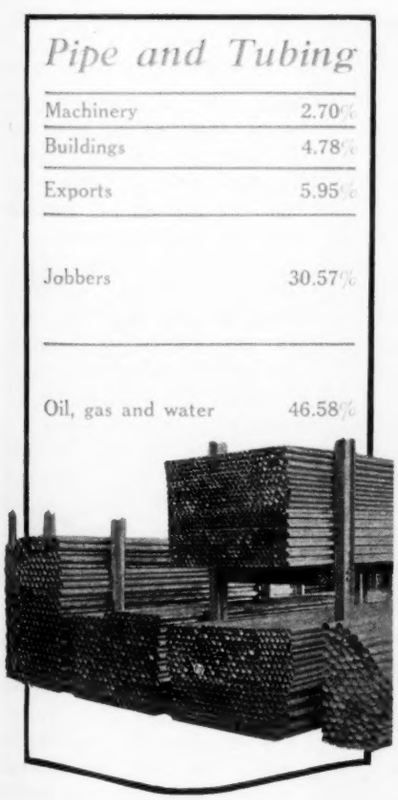
Wire products tonnage remained practically stationary over the two-year period, the 1927 total being 2,257,167 tons, and that for 1928, 2,267,376 tons. Tubing and pipe requirements in 1928 were slightly lower than in 1927, the total for the former being 3,139,075 tons, and the latter 3,404,921 tons.

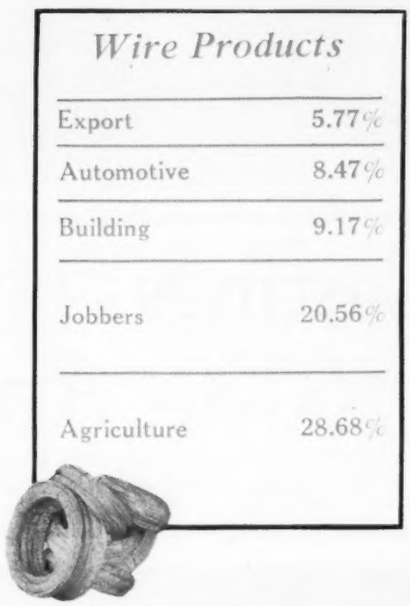
Jobbers and warehouses handled less steel in 1928 than in 1927, the total for the year just ended being 3,422,681 tons, or 10.78 per cent of the total distribution. This compares with 3,602,640 tons and 12.71 per cent in 1927, and 3,279,592 tons and 10.93 per cent in 1926, the first year that jobber shipments were segregated from the consuming groups.

Semifinished steel materials shipped by producers to other mills for further conversion gained slightly in 1928 over 1927. The largest increase was in wire rods, 760,545 tons being shipped in 1928, compared with 470,002 tons in 1927 and 613,812 tons in 1926. Billet and slab shipments in 1928 also were heavier than in 1927 or 1926, as were sheet and tin bars. Skelp shipments in 1928 were about 25 per cent greater than those of 1927, but were slightly under the figure of 608,031 tons distributed for further conversion in 1926.

Following are listed comparisons of semifinished shipments for further conversion in 1928 and 1927:

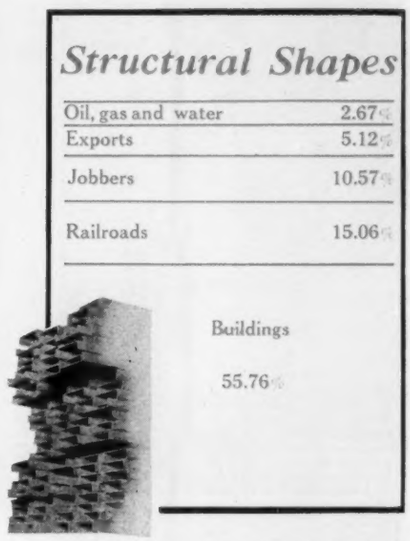
	Gross Tons	
	1928	1927
Billets and slabs	1,337,468	1,151,089
Sheet and tin bars	1,183,330	1,177,162
Wire rods	760,545	470,002
Skelp	583,160	466,219





An interesting portrayal of finished steel consumption is presented in the table on page 452 showing the distribution of products to industries by percentages. From this table may be obtained an indication of the relative influence of various industries on different products. It shows, for example, that 90.85 per cent of steel rails go to track construction and repair, 55.10 per cent of structural shapes to building erection, 33.44 per cent of bars to automotive, 54.41 per cent of concrete bars to building and 32.11 per cent to highways, 67.39 per cent of black plate for tinning to the food and packing industry, 18.69 per cent of galvanized sheets to building erection, trim, etc., 46.58 per cent of tubing and pipe to oil, gas and water, 28.68 per cent of wire products to agriculture and 58.74 per cent of strip steel to automotive.

The part that jobbers and warehouses play in the distribution of the different products also is more clearly designated by the percentage



relationship, for example, indicating that 30.57 per cent of all pipe was handled through that channel.

Auto Parts Storage Calls for Steel Sheets

At least three manufacturers of steel bins, shelving, etc., understand that recommendations have been made to its 8000 dealers, by the Ford Motor Co., that steel bins for parts storage, steel shelving, etc., are desirable for the sake of efficiency, durability, permanence, appearance, etc., as well as from a cost standpoint. About 50 per cent of these dealers already have steel equipment; others are installing it. Not a few are engaged in engineering and plan drawing to achieve the best possible layout for all parts of the new model A as well as the old Model T, since not only is a supply carried of the single parts going to make up the cars in question but the various assemblies likewise are carried complete, such as a brake, clutch, transmission, carburetor, steering assembly, etc.

Since no effort will be made to disturb those dealers who have efficiently working wood equipment—possibly in excess of 3000 will be installing the equipment. In all probability, more than 10,000 tons of steel will be required. It is reported at Detroit that each dealer will order his own installation and that they will not be ordered from one central point.

Chevrolet dealer stores numbering 3500 to 5000 are understood to be about one-third equipped with steel bins and shelving.

Geneva Tool & Machine Co., Geneva, Ill., has changed its name to Active Metal Products Co. J. C. DeWolf, 1125 Chicago Temple, Chicago, is correspondent.

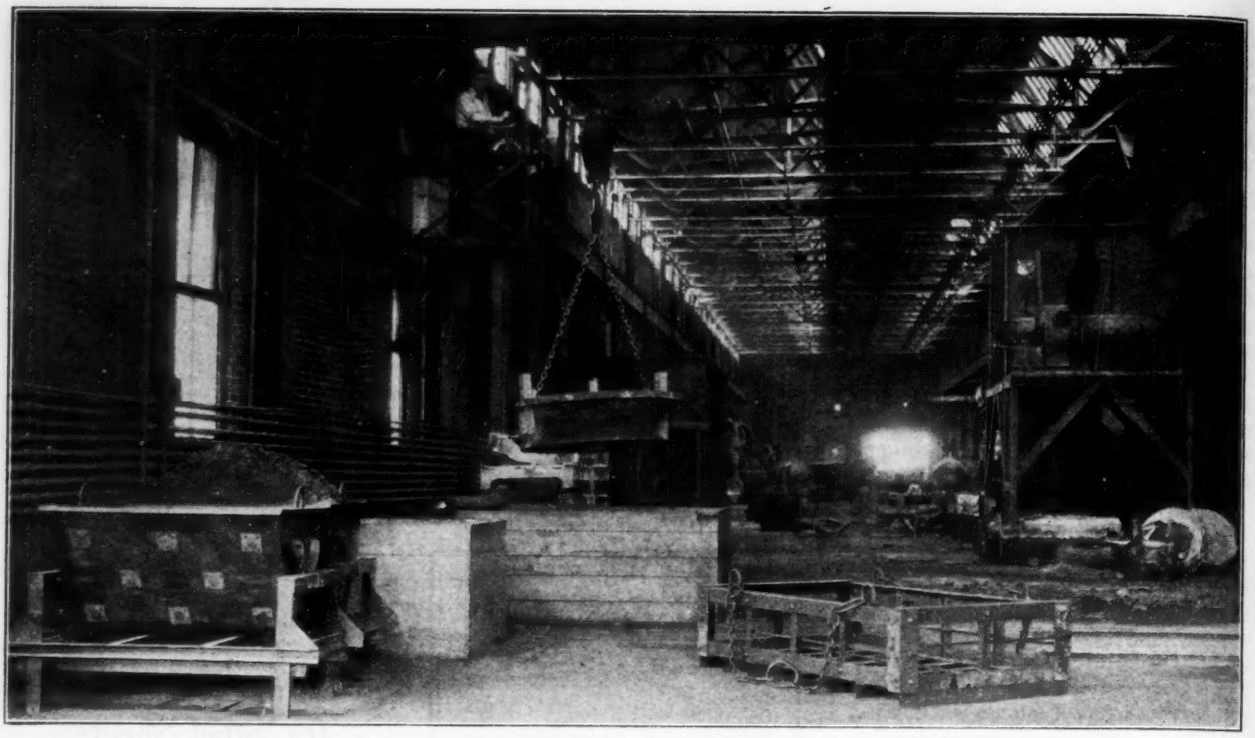


Fig. 1—Lowering casting into basement washroom. Small castings are loaded in frame at right

Cleaning Castings Hydraulically Saves $6000 Annually

By James Prendergast

Sullivan Machinery Co., Claremont, N. H.

WHETHER or not to adopt a hydraulic method for cleaning castings has been a debatable point with many foundrymen in recent years. The high cost of water prevents many, perhaps the majority of foundrymen from installing a cleaning plant of this

Fig. 2—Former method of removing cores

character. This is true particularly in foundries where the only source of water supply is the city mains and where the water, as waste, must be run into the sewer. Where a reservoir can be installed to catch the waste water and where the same water can be used repeatedly, the cost of the water is reduced greatly, thus bringing the method within the grasp of almost any foundry for cleaning the cores out of medium size and large castings. While looking up data on the subject I found that the first published reference was in June, 1909. James A. Murphy, at that time foundry superintendent at the plant of Hoovens-Owen & Rentschler Co., Hamilton, O., experimented with a fire hose to wash out cores. His success encouraged him to install a small pump by which the water pressure was increased to approximately 300 pounds per square inch. Although an account of this new method was published at the time in the technical press, no other foundrymen appears to have given the matter any consideration for many years. In fact for several reasons, which are not perti-

nent to the present discussion, the method eventually was abandoned by the Hamilton foundry.

The next installation of which we have any record is that at the gray iron foundry of the General Electric Co., Erie, Pa., about 1920, followed a few years later by a somewhat similar installation at the plant of the Allis-Chalmers Co., Milwaukee.

Back in 1912 before either of us had learned of the early experiments, Mr. Copeland, president of the Sullivan Machinery Co., suggested to me the advisability of trying out this method in the foundry conducted by the company at Claremont, N. H. The idea did not appeal to me. I could not see how any man could do the work without becoming water soaked. A rubber suit might offer a certain measure of protection in the summer, but clearly the work could not be carried on under the severe climatic conditions which prevail throughout northern New England in the winter season.

Install Core Breakers

The hydraulic idea was dropped for the time, but we did improve methods of removing cores by digging them out with large pneumatic hammers instead of the former steel bar and sledge hammer. This method represented quite an improvement over those formerly employed. It relieved the men of a great deal of disagreeable and laborious effort and also reduced costs in the cleaning department. This method of breaking up the cores with pneumatic tools has been adopted quite extensively in the foundry field, and I believe it to be the best way of doing the work where water facilities are not available.

Although shelved temporarily, the hydraulic idea was never abandoned, but was taken out of seclusion periodically for overhauling and general inspection. During 1926 I visited several plants where improved methods and equipment had been installed for cleaning castings hydraulically. Working conditions showed such a marked improvement and cleaning costs had been reduced so materially that I unhesitatingly recommended the adoption of the hydraulic method in our foundry at Claremont, N. H. I favored the style of installation in use at the plant of the General Electric Co., Erie, Pa., with certain modifications to suit our particular conditions. We tried it out first in September, 1927, with highly gratifying results and it has measured up to expectations consistently since that time. The annual net saving as shown later almost equals the cost of installation.

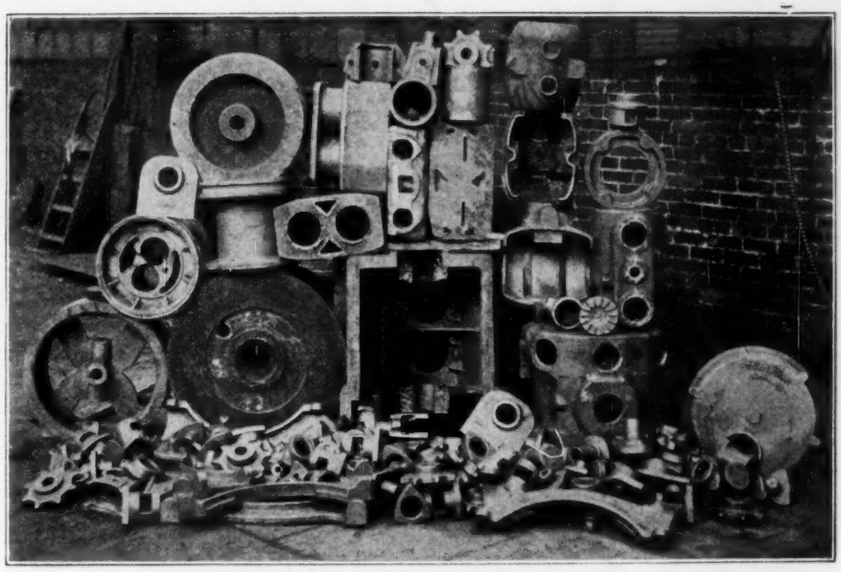


Fig. 4—Reclaimed sand used for facing on these castings

Wide Range of Castings

Typical castings are shown in several of the accompanying illustrations. The Sullivan Machinery Co., Chicago, operates plants at Claremont, N. H., and at Michigan City, Ind., where it manufactures stationary and portable air compressors, air and electric hoists, coal mining machinery, core drills for prospecting and oil drilling, hammer drills and concrete breakers for construction work. From the foregoing list and the illustrations it is apparent that castings are made in a wide range of sizes and that dry sand cores are employed extensively.

Layout of the plant near the river and with a basement under the cleaning room, lent itself readily to the installation of the

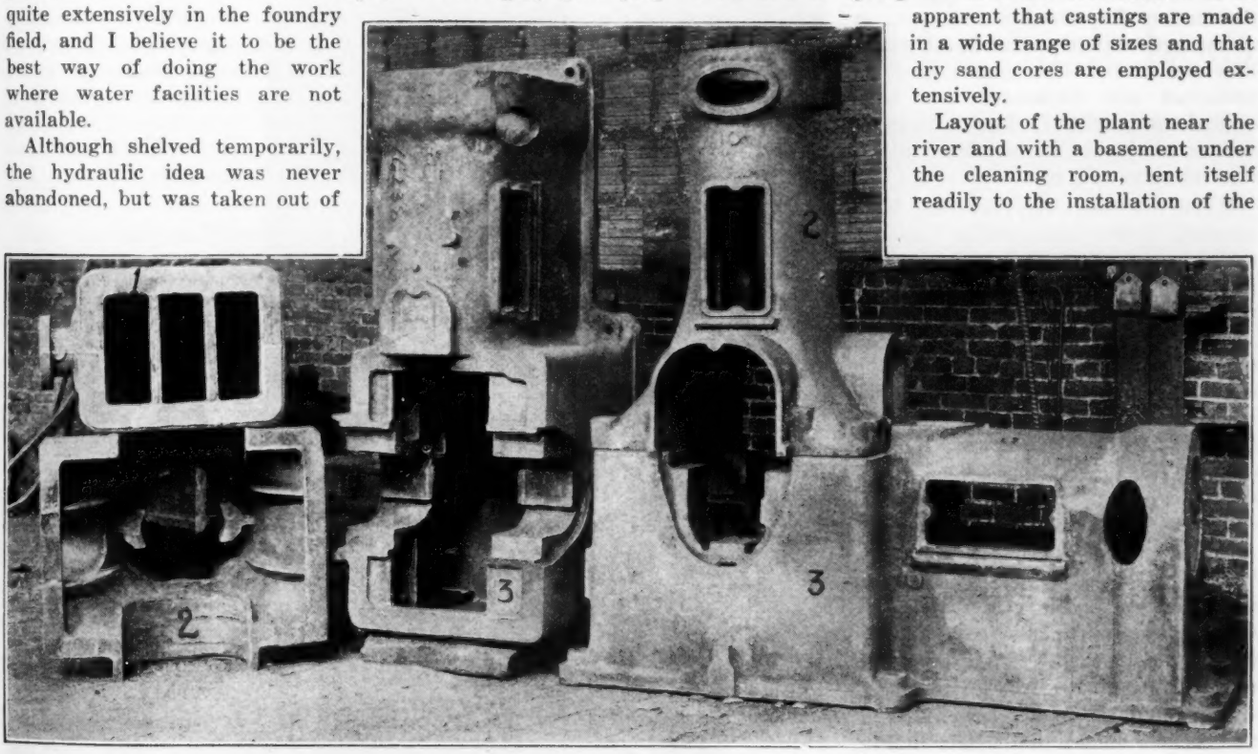


Fig. 3—Typical castings on which cleaning time has been reduced materially

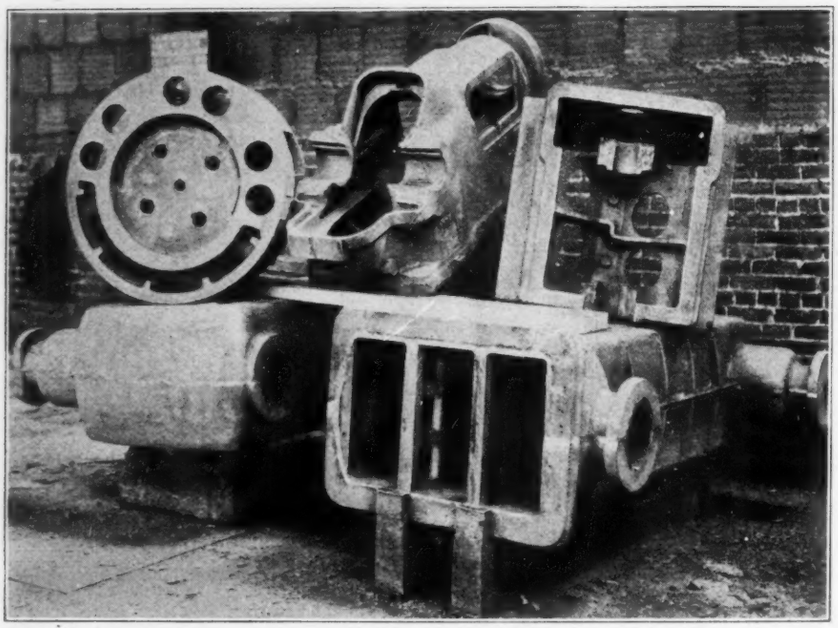


Fig. 5—Cores are washed out with hydraulic stream

new cleaning method. The castings to be hydroblasted are lowered as shown in Fig. 1, through an opening in the main cleaning room floor, to the room in the basement set apart and equipped for the purpose. The floor of this room is considerably higher than the floor of the basement and as a result the water drops about 12 feet before it flows back into the river. Separation of fine and coarse sand takes place in this distance. Agitation of the water effects a mechanical separation and also conveys the sand to its appointed destination. The fine, burned sand is discharged with the stream of water into the river The coarse sand is reclaimed and discharged into suitable dump buckets. The process is illustrated in several of the accompanying illustrations.

Water carrying sand that has been cleaned from the casting rushes through a suitable opening in the floor to a screen which catches rods, nails and large pieces of core. From the screen it flows into a trough, Fig. 6, arranged to reduce the speed of the stream and cause increased agitation and thus more effectually break up the sand on its way to a second and finer screen. This 50-mesh screen catches all the sand which we consider worth reclaiming. As it accumulates, the pressure behind forces it through a slot into a space divided in the center to direct the sand to two spouts located above two dump buckets placed there to receive it, as shown in Figs. 6 and 7. A large number of screened holes in the buckets shown to the left in Fig. 1, permit most of the water to drain out of the sand during the night. The fine sand passes through the 50-mesh screen and is carried with the stream of water and discharged into the river.

After draining all night, the sand in the dump bucket is used for facing sand for the side floor, bench and machine molders. No new sand is added. The facing mixture is made up of 50 per cent gangway sand, 50 per cent reclaimed sand with the usual amount of sea coal and approximately 1.5 per cent fire clay. This mixture is run through the muller in the usual manner. The facing is giving excellent satisfaction and shows a real saving in amount of new sand required in the foundry. A group of castings made in molds faced with this mixture is shown in Fig. 4.

Installation of hydraulic method and equipment has relieved us of the hardest labor problem with which we had to contend. The labor turnover in the cleaning department, at one time higher than in any other department, has been eliminated entirely. Accidents due to flying sand, fins and chips, formerly giving this department the unenviable reputation of having the highest accident rating in the plant, also have disappeared. We

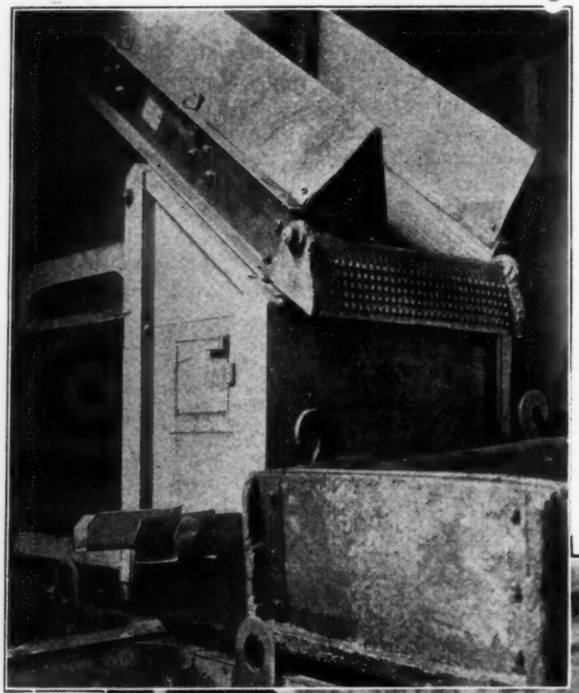
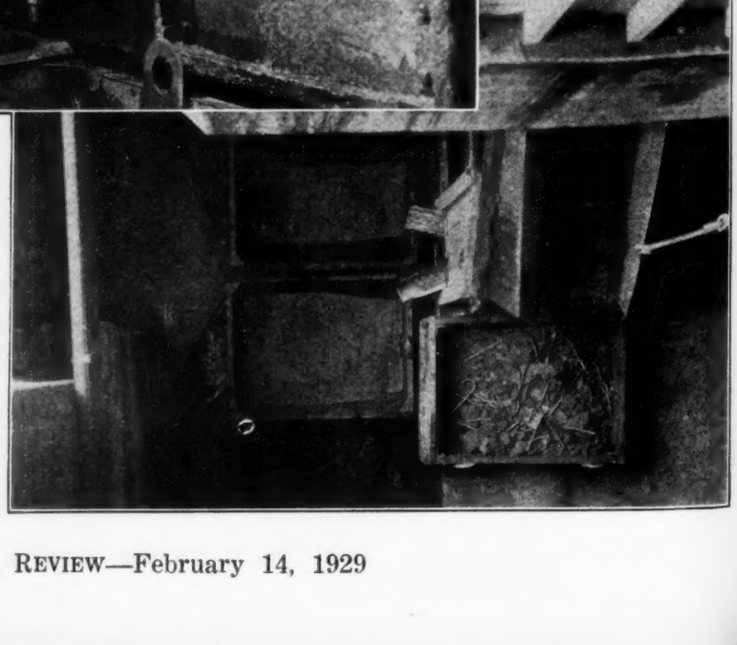


Fig. 6 (Left)—Metal and lumps of sand fall into box. Fine sand is carried on with water into buckets. Fig. 7 (Below)—Looking down shaft into scrap box and reclaimed sand buckets



no longer are hampered and delayed by the presence of uncleaned castings and large piles of sand and rubbish due to our inability to get men to attend to the work. Congestion and delayed deliveries are things of the past. Cores are removed in a more thorough manner than formerly, thus relieving the machine shop of considerable supplementary cleaning of pockets and corners that escaped under a former process.

Requires Fewer Men

The hydroblast does not do away with the sandblast altogether. However, on account of the preliminary cleaning, the work of the sandblast operator has been reduced to a minimum. One man does all the work, as compared with five formerly required.

Most of the castings are cleaned the day after they are poured. Naturally, large castings require cooling time, varying with their size and weight. It is not necessary to wait until they have cooled to atmospheric temperature. With the class of castings handled in this foundry the cleaning program never is more than one day behind.

An idea of the approximate saving effected by the new method may be gained from a comparison of the cleaning time on a typical group of castings shown in Fig. 3. Under the old method a total time of 5 hours was spent on No. 1, while Nos. 2 and 3 required a total of 8 and 15 hours, respectively. Under the hydraulic method the cores are cleaned out of the first in 20 minutes, out of the second in 30 minutes, and out of the third in 2 hours. In percentage terms the cleaning time on these three representative castings has been cut to 4, 6, and 13.3 per cent of the former time.

The wash room, 16 feet square, 11 feet high, is provided with a motor operated turntable which may be moved intermittently, or, if desirable, at a speed of 2½ revolutions per minute. A high pressure pump located below the wash room takes water from the river and delivers it at the nozzles at 300 pounds pressure and at a rate of 400 gallons per minute. The operator with his various controls, is housed in a waterproof chamber adjoining the wash room.

Two nozzles, one located above the other, afford the operator the opportunity of directing the stream of water against the casting from practically any angle. The nozzles are well balanced and therefore easy to handle. The operator can watch results closely through a heavy plate glass window located close to each nozzle. When the glass becomes obscured, the operator opens a valve which allows a stream of water from the high pressure line to squirt through a perforated pipe above the window and thus wash it clean. Controlling device for the turntable is located within reach of the operator at the nozzle.

Cost of installation, expense of operation and estimated yearly savings are shown in the following tabulation:

Actual cost of hydroblast installation	$7900
Annual operation expense	
Fixed charges (interest and depreciation) 15 per cent	1185
Power, 50,000 kilowatt hours at $0.0128	640
	$1825
Saving	
Labor (4 men, 10,800 hours at $0.45 per hour)	4860
Reclaimed sand (500 tons at $6 per ton)	3000
	$7860
Less annual operating expense	1825
Net annual saving	$6035

Combustion and Furnace Problems Discussed

Members of the Pittsburgh section of the combustion engineering division of the Association of Iron and Steel Electrical Engineers took part in discussions of general interest at their midwinter conference held Jan. 23 in the William Penn hotel, Pittsburgh. Martin J. Conway, fuel engineer, Lukens Steel Co., Coatesville, Pa., chairman of the division, presided at the meeting.

Prior to the presentation of the program, President C. S. Proudfoot of the association announced that the annual meeting and exhibition will be held in the William Penn hotel June 17 to 21. The basement and seventeenth floor of the hotel will be given over to the exhibits.

Papers presented at the meeting dealt with various phases of combustion practice and furnace construction in the steel industry. A. R. Tegge, assistant chief engineer, Lukens Steel Co., Coatesville, Pa., discussed "Furnace Bindings." Isley open-hearth furnaces were described by G. A. Merkt, engineer, Morgan Construction Co., Worcester, Mass. The subject of an address by J. D. Corfield, engineer, Michigan Steel Casting Co., Detroit, was, "The Use of Heat Resisting Alloy Steel in the Steel Plant."

The North Western Steel & Iron Works, Eau Claire, Wis., which in recent years has devoted most of its attention to the manufacture of steam kitchen utensils, has changed its corporate title to National Pressure Cooker Co.

Useful Sawhorses Made by Welding Discarded Angle Irons

MANY manufacturing shops can use a pair of carpenter's horses, and few are without these handy accessories. The trouble with most carpenter's horses, however, is they usually are made of wood and have a tendency to break or spread after they have been subjected to hard usage. The plant welder of a large eastern shop constructed a pair with some scrap angle iron. The finished product was a great improvement over the wooden horses that had been used. The illustration clearly shows the construction of the horses and the location of the welds. The pieces were welded with butt-type joints and a small amount of welding rod added for extra strength, using the oxyacetylene process. Cross members give added rigidity to the legs.

Foundrymen Arrange Program

American Foundrymen's Association Schedules Thirty-third Annual Convention in Chicago, April 8-11

All Activities To Be Housed in Stevens Hotel —Courses in Shop Operation Planned—Papers Are Diversified

CONSIDERATION has been given to the various branches of the foundry industry in preparing the program of sessions and technical papers for the thirty-third annual convention of the American Foundrymen's association, to be held in Chicago, April 8 to 11, inclusive. Convention headquarters will be at the Stevens hotel.

As an outgrowth of the foundry operation course, which was held in conjunction with the convention last year, similar courses will be conducted at the 1929 meeting. The steel foundry course will include a four period shop operation on the fundamentals of pouring practice, heat treatment, core room practice and sand control of the steel foundry. A four period shop course also has been arranged for the gray iron section. Topics which will be considered by the latter section will include cupola control, sand control fundamentals, gates and risers and cupola melting operations.

Nonferrous foundry costs and the group method of handling uniform cost methods will be discussed at a luncheon meeting following the morning cost session, April 9. Many authorities on foremen training who have had experience in organizing foundry training programs will discuss this movement at a symposium Wednesday, April 10. The object of this meeting will be to show what has been accomplished by training foundry organizations.

Shop problems of the malleable, nonferrous and steel casting plants will be discussed informally at luncheon gatherings. R. J. Doty, works manager, Reading Steel Castings Co., will preside at the round table meeting on steel founding. J. W. Bolton, chief metallurgist, Lunkenheimer Co., will serve as chairman of the brass foundry round table. Prof. Scott Mackay, University of Wisconsin, will lead the discussion on malleable iron founding.

The annual foundry sand session will be divided into two parts. Discussion at the first sectional meeting will deal largely with the fundamentals of sand control in the various types of foundries. Following a dinner gathering, the second section of the meeting will include the presentation of papers and reports and a discussion of these.

Two important meetings have been scheduled for gray iron foundrymen. The first will deal with the discussion of data secured by the General Motors Corp. research staff on the effect of blast furnace practice on the quality of iron in the casting. The second session will be a symposium for the discussion of the development of high test cast iron in Europe and America.

Technical sessions will be held on the third floor. Exhibits of the technical department, including sand testing demonstrations and apprentice contest exhibits, will be shown in the third floor corridor. The exhibition hall, one floor below the main lobby and general offices, will house the display of foundry equipment. Here also will be located convention registration and information booths.

The schedule of sessions for the week is as follows:

Monday, April 8

Registration and committee meetings.
First session gray iron and steel shop operation courses.

Tuesday, April 9

10:00 a.m.—Foundry costs.
Steel founding.
Cast iron metallurgy.
12:30 p.m.—Round table on nonferrous foundry cost methods.
Round table on steel founding.
2:00 p.m.—General foundry practice and management.
4:00 p.m.—Second session gray iron and steel shop operation courses on sand control methods.
6:30 p.m.—Dinner gathering of those interested in sand control.
7:30 p.m.—Sand control.

Wednesday, April 10

10:00 a.m.—Nonferrous foundry practice.
Iron foundry practice.
Materials handling.
12:30 p.m.—Round table on nonferrous shop practice.
2:00 p.m.—Foreman training.
4:00 p.m.—Third session gray iron and steel foundry shop operation courses.

Thursday, April 11

10:00 a.m.—Malleable iron.
Apprentice training.
12:30 p.m.—Round table on malleable iron foundry practice.
2:00 p.m.—High test cast iron.
4:00 p.m.—Fourth session gray iron and steel shop operating courses.

Among the technical papers which have been scheduled are the following:

"Principal Aspects of the Value of Foundry Cost Methods," by E. T. Runge, Cleveland.

"Alloy Cast Steels," by D. Zuege, Sivyer Steel Casting Co., Milwaukee.

"Efficient Steel Casting Grinding," by F. A. Lorenz Jr., American Steel Foundries, East Chicago, Ind.

"Report of Investigation of Effects of Phosphorus and Sulphur in Steel," by R. A. Bull, Electric Steel Founders Research Group, Chicago.

"Quality of Pig Iron and Cast Iron as Affected by Blast Furnace Practice," by A. L. Boegehold, General Motors Corp., Detroit.

"Use of Scrap in Gray Iron, Malleable and Electric Steel Mixtures," by E. K. Smith and F. B. Riggan, Stockham Pipe & Fittings Co., Birmingham, Ala.

"Safety and Sanitation in the Foundry," by F. H. Elam, American Steel Foundries, Chicago.

"The Refractoriness of Foundry Sands," by J. F. McMahon, mines branch, department of mines, Ottawa, Canada.

"Some Practical Problems in the Brass Foundry," by H. J. Roast, National Bronze Co. Ltd., Montreal, Canada.

"An Open-Flame Hearth-Type Furnace for Melting Aluminum and Its Alloys," by R. J. Anderson, G. E. Hughes and M. B. Anderson, Fairmont Mfg. Co., Fairmont, W. Va.

"Electric Arc Furnaces in General Jobbing Brass Foundry," by J. B. Meier, F. & H. Foundry Co., Newark, N. J.

"A Study of 36-Inch Cupola Operation," by F. B. Coyle, International Nickel Co., New York.

"Some Problems of Cupola Operation," by G. S. Evans, Mathieson Alkali Works, New York.

"Investigation of Causes of Defective Castings for Enameling Ware," by C. J. Scullin, Tucker-Scullin Inc., St. Louis.

"Mold Handling," by R. J. Heisserman, Link-Belt Co., Philadelphia.

"Materials Handling in the Foundry," by A. Walton, Philadelphia.

"Controlling the Atmosphere in Malleable Annealing Ovens," by W. F. Graham, Ohio Brass Co., Mansfield, O.

"Practical Aspects of White Fracture Malleable Iron," by Duncan Forbes, Rockford-Northwestern Malleable Corp., Rockford, Ill.

"Why We Train Apprentices," by J. A. Davies, Westinghouse Electric & Mfg. Co., Philadelphia.

"How We Train Apprentices," by A. M. Cornell, Pettibone-Mulliken Co., Chicago.

Name Merged Companies

American Radiator & Standard Sanitary Corp. is the name adopted as a result of the merger of the American Radiator Co., New York, and the Standard Sanitary Mfg. Co., Pittsburgh, which stockholders of both companies approved recently.

Cold rolled tinned strip steel is being widely employed in Germany for fabricating into cans used for packing foodstuffs.

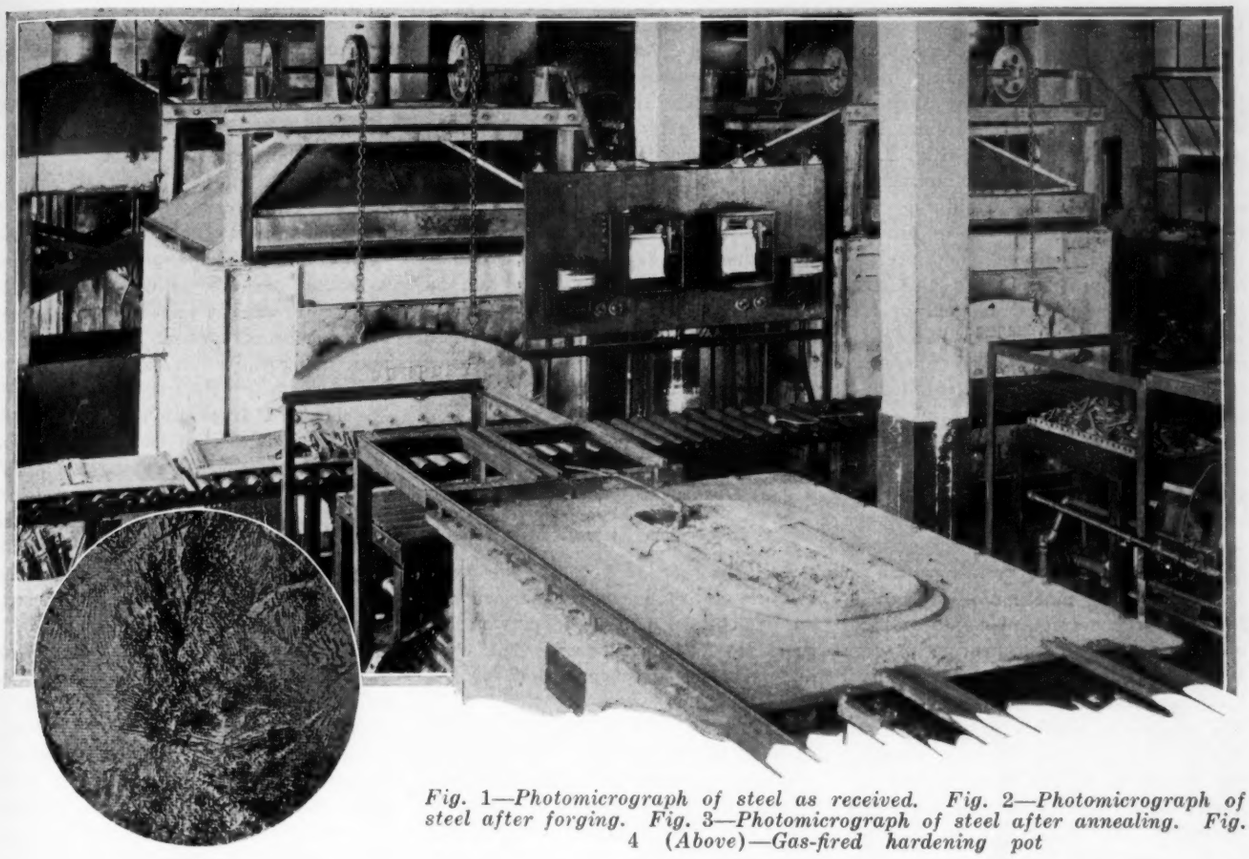


Fig. 1—Photomicrograph of steel as received. Fig. 2—Photomicrograph of steel after forging. Fig. 3—Photomicrograph of steel after annealing. Fig. 4 (Above)—Gas-fired hardening pot

Wrench Parts Hardened By Heat Treating

Gas-Fired Lead Pots Are Designed for Continuous Flow of Material

By J. E. Hart

General Superintendent, Walworth Co., Boston Works

THREE fundamentals of manufacturing practices constitute the foundation upon which the Walworth Co. makes the stillson-type wrench. They are the selection of the proper raw material; the application of heat in the annealing, toughening and strengthening and hardening of the parts of the wrench; and, machining to insure proper functioning of the tool in its finished assembled form. Improvements in the manufacturing process have given this type wrench an entirely new and better constitution without any change in the basic design.

Steel Is Selected

The basic open-hearth steel used in the drop forged bar and jaw is purchased on specifications which call for close limitations in physical and chemical properties. This steel has an 0.80 per cent carbon content. Fig. 1 is a photomicrograph of steel as received, etched for microscopic examination.

The first step in the process of manufacturing is forging. Bars of steel are heated and then drop forged. The forger passes the bar between blows from anvil to edger, to rough impression, to the finish impression. This forging operation is completed in one heating, which limits the possibilities of decarbonizing the steel. Microscopic examination shows the decarbonized surface, after forging, to be less than 0.025-inch thick. This surface is eliminated in the grinding and machining operations. The flash is removed by cold trimming in a press.

The cooling of the hot forging in air gives the steel a structure ranging from pearlite to sorbite. These iron-carbon structures are accompanied by coarse grain structures due to continued heating of the steel at or above critical temperature before

the forging operation. The brinell readings of forgings at this stage range around 250, depending upon the size of sections of the forgings and therefore the rate of cooling. This steel structure is shown in Fig. 2.

After the forging and trimming operations and before machining, the forgings are annealed. The annealing operation removes the internal strains set up by working the steel in the drop hammers as well as the strains incident to the rapid cooling of the forging in the air. The steel is transformed into a soft, malleable, machinable condition. The grain is partially refined and the structure becomes the basis for following heat treatments.

The annealing treatment changes the pearlite and sorbite to a partially globular pearlitic structure which is known for its machinability, and is termed the spheroidized condition. The effectiveness of the annealing process is continually checked on a brinell instrument by the sampling method. We require a reading of 180 or less. Fig. 3 is a photomicrograph showing the structure of the steel in the annealed condition. After the annealing operation the forgings are handled to a stores area known as forgings stores. From here parts are drawn as required by the machining departments. Throughout the following operations work in process is handled in steel pans on roller conveyors.

Upon withdrawal from forgings stores the first operation consists of snagging the fin or flash not thoroughly removed by cold trimming. The faces are then rough disked on double-disk grinding machines. This is performed to comply with slip gage measurement and is followed by piece inspection.

Containers carrying the bars and jaws then are forwarded over a long section of roller conveyor to the machining department. The jaws go to centering machines which mill centers in the shank ends for centering in the thread milling machine. The jaws then are routed to the teeth milling machines which are operated in batteries. One operator cares for a group of these machines.

Jaws Are Thread Milled

Following inspection of the teeth, the jaws pass on to the thread milling machines. Piece inspection and checking for gage precede the washing operation in preparation for heat treating.

Meanwhile the bars are routed through the heel milling machines and through the various other machining operations to the important milling of the teeth. Here again changes have been made in the angle of the teeth. Previously the bar teeth had a combined angle of 75 degrees, the angle on the back of the tooth being 50 degrees and that on the front 25 degrees. This was the reverse of the same angles in the jaw. The teeth on the bar were sharp, and were not adequately protected from breakage or flattening. On the new type wrench, bar teeth are of improved design. The combined angle of the tooth is 90 degrees, 45 degrees on a side. Its shape is an isosceles triangle. The crest of the tooth has a slight radius. The design of the spring has been changed from square to round corners, to avoid the possibility of sharp edges catching on clothing or scratching the hand of a man using the wrench.

The nuts of the new type wrench are blanked from rods on automatic screw machines and tapped on multiple spindle vertical tapping machines. The threads are held in close tolerances to insure proper fitting with the jaw on the assembled units. The nut, like the bar and jaw, is cleaned and conveyed to the heat treating department.

The machining operation completed, it is no longer necessary or desirable to retain the ductility or softness in the steel brought about by the annealing treatment. It is essential, however, that the wrench parts shall have the maximum strength, consistent with resistance to shock. A moderate degree of ductility or elasticity therefore is required.

The parts then are heated in furnaces to predetermine temperature and the heated work when ejected, rolls down an inclined roller conveyor submerged in a tank of oil and is promptly quenched. The oil used for quenching is maintained at the desired temperature by a circulating control apparatus.

When cooled to a proper temperature the pieces are withdrawn from the quenching oil by means of a motor-driven hoisting apparatus. This elevates the section of roller conveyor well above the oil quench tank. After sufficient time is allowed for draining, the work moves along the conveyor to the tempering furnace. The work is charged and heated in the same manner as in the high heat furnace and then withdrawn and cooled.

The heating of the parts in the high heat furnaces brings the steel to a state of solid solution. The ferrite and cementite of carbon steels at ordinary temperatures change to a solid solution called austenite at the critical or transformation temperature. In cooling or oil quenching, austenite disappears and any or all of the three transition constituents, known as martensite, troosite and sorbite, appear. Where martensite is the chief constituent the hardest and most brittle structure is obtained. Troosite is less hard and is the chief constituent of the structure obtained

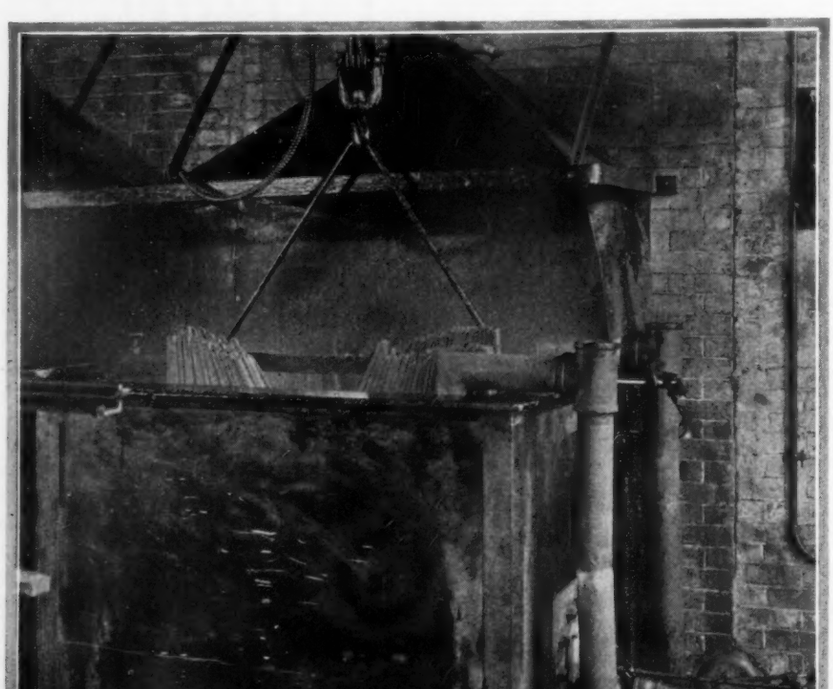


Fig. 5—Gas-fired salt bath used for tempering

in the high heat furnace. Sorbite, known as the "tough" structure, combines strength with resilience, and gives strength without brittleness. A complete sorbitic structure, however, cannot be reached without reheating the work. Therefore upon quenching in oil from the high heat furnaces, the work is charged in the low heat furnaces.

Our laboratory tests show that a piece of 0.80 per cent carbon steel, heat treated as described, would have a brinell hardness number close to 302. We have therefore, prescribed that this treatment is checked by brinell between the ranges of 280 and 320. The tensile strength of such steel is approximately 160,000 pounds per square inch and has an elongation of 15 per cent in 2 inches.

Resists Permanent Bend

On a 14-inch steel handle wrench, a load of 1500 pounds was applied at a point on the handle 11⅛ inches from the centerline of a 1⅞-inch diameter grip bar. This produced a 25 degree bend, distributed over and absorbed by, the shank of the jaw and the wrench bar. Upon releasing the load, the wrench assumed its original shape and no permanent bend remained. This indicated that the steel in the wrench had not reached its elastic limit. Under the old heat treatments a permanent 25 degree bend was brought about by a 900-pound load applied in the same manner as in the test of the new improved wrench.

The heat treatment for strength is followed by the hardening and tempering treatments, applied to the tooth sections of the bars and jaws. Recently we installed new and novel equipment including two large gas-fired lead pot furnaces in which the tooth sections are heated.

These lead pots are designed for a continuous flow of material. A fixture is loaded with wrench parts and moved to the lead pot where these parts are immersed in molten lead and heated for a definite length of time. The parts are withdrawn from the lead bath and transported along the track to a tank filled with water. Here the parts are quenched, withdrawn and moved to the unloading station, where they are dropped. The fixture is then switched to a rear track and returned to the loading station, completing the cycle. After quenching each piece is inspected and file tested. Periodically a piece is broken for grain structure inspection.

Strains are set up in the steel from this rapid water quench, which, if not relieved, would tend to breakage and brittleness. It is therefore necessary, that the tempering operation follow almost immediately the water quenching.

The parts are therefore basketed, and conveyed to and lowered into the oil tempering tank. This oil tempering operation is conducted at temperature which produces a tooth section that is not so hard that the teeth will chip, nor yet so soft that they will become blunted. The tempering operation is primarily to relieve stresses introduced by the hardening operations. The hardening and tempering treatment results in the steel having a hardness of 54 to 58 points Rockwell, "C" scale.

The heat-treated bars and jaws, with hardened tooth sections, move into the polishing room and are put through an automatic sandblasting machine. This removes all scale, giving a clean product of a gray color suitable for an even and smooth coat of lacquer.

The parts next move to machines where fine-grained emery wheels grind two surfaces at one time. This grinding is a finish operation and little of the surface is removed. It is sufficient to give proper finish and reduce any slight degree of decarburized surface. The work is checked by visual inspection. The curved surfaces, such as the head of the jaw and the front and back edges of bar, are polished on canvas wheels coated with emery.

The wrench frames are cast from air furnace malleable iron, having a tensile strength of 55,000 pounds per square inch, with 10 per cent elongation. The yield point is at 30,000 pounds per square inch.

The springs are assembled on the bars by means of a tapered rivet with a round, formed head. This rivet is driven in the hole in the bar and in this manner swelled and fitted so that the taper of the rivet grips the interior surface of the hole and remains stationary.

The malleable iron frames are fastened on by a rivet which is spun on both of its ends to hold firmly, and to present a neat appearance. Finally the jaw and nut are assembled with the bar.

Wood handle wrenches go to work stations where the upper ferrule is mounted and the handle fitted over the end of the steel bar. The combination endnut and ferrule is screwed on, and the projecting end of the steel bar ground off.

Lacquer Is Applied

After assembly the steel handle wrenches are dressed in a red lacquer. The wood handles are purchased from the vendor ready lacquered. The steel handle wrenches, after assembly, are placed in fixtures on an automatic dripping machine which lowers them into vats of lacquer. They are slowly withdrawn to permit a degree of drying. This eliminates streaking and furnishes a smooth lacquer job. The wrenches are then placed in racks for drying and afterward are thoroughly cleaned. Finally a fine mist of parolin is applied to make certain that the product is free from corrosion when it reaches the customer.

The finished wrenches are thoroughly inspected and afterwards taken to the wrapping bench where each wrench is wiped and placed in a paper bag and wrapped in a standard box. They are conveyed to, and then down a spiral chute to the stock rooms.

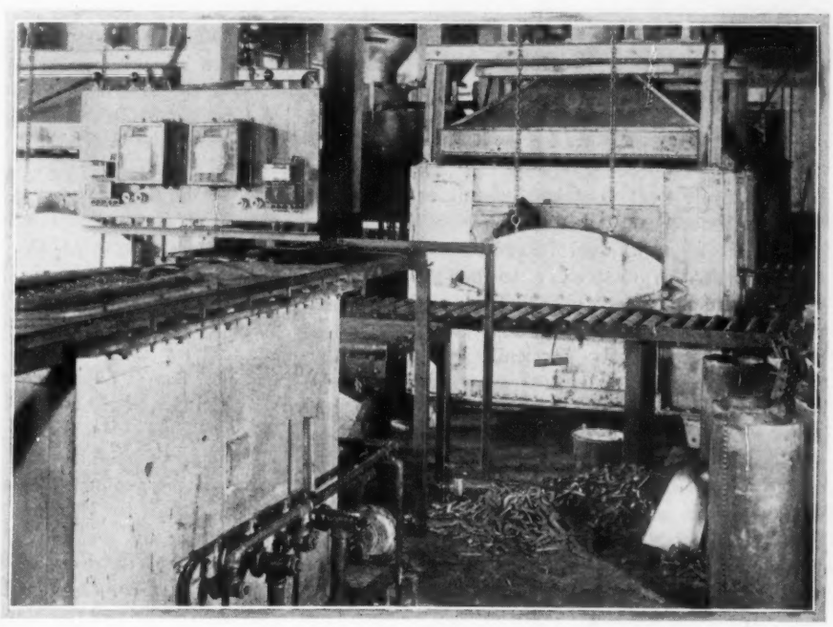


Fig. 6—Gas-fired pot used for hardening tooth sections

Need More Accurate Determination of Working Fiber Stress

Proposed Formula Based on Tensile Strength and on Ductility as Revealed by Bend Test, Checks with Experience

By S. W. Miller

Gave Much To Welding

SAMUEL WYLIE MILLER, whose death on Feb. 3 was reported in last week's issue of IRON TRADE REVIEW, *was one of the world's leading authorities on welding. From 1910, when he engaged in a welding business of his own, until the time of his death, when he was consulting engineer of the Union Carbide & Carbon Research Laboratories, he was a liberal contributor to the knowledge of welding.*

Among his last technical offerings to the literature of this important process of fabrication is the accompanying discussion of the determination of working fiber stress, which is abstracted from a paper presented at the fall meeting of the American Welding society, Philadelphia, Oct. 8 to 12, 1928. The comments made by the late Mr. Miller on the present lack of a definite basis for design are worthy of the careful attention of every engineer and metallurgist.

WHAT working fiber stress should be used in designing structures? This question always has been in the minds of engineers. Economy demands the least possible amount of material, while safety urges the engineer to put in plenty of material so that the structure will be safe.

Steel has the property of perfect elasticity under stress up to a certain point, which is called the yield point, proportional limit and elastic limit. All are close together in amount when measured, as usual, in pounds per square inch, and really are variants of what we call elasticity —that property of matter which causes it to return to its original dimensions after it has been deformed. To be accurate the foregoing can be applied only to material that is homogeneous. Actually there is no such material, but steel is sufficiently homogeneous to enable us to design and build structures that are safe in service.

If we knew in any particular case the exact maximum stress to which a structure would be subjected in service, and if we had homogeneous material, we could use in the design of the structure a stress close to the point at which the law of elasticity fails. However, we cannot know the stresses to which a structure is subjected in service, nor do we have homogeneous material. We are, therefore, forced to use in our design a less stress than that referred to—how much less depending purely on experience and judgment.

The ratio of the theoretically possible stress to the one actually used may be called a factor of safety. Usually, however, the factor of safety is taken as the ratio between the ultimate strength of the material and the actual working fiber stress selected.

Let us consider the case of mild steel of an ultimate strength of 55,000 pounds per square inch, having a yield point of 35,000 pounds per square inch. If the material were homogeneous and we were sure that no greater stress than 34,000 pounds per square inch would ever be applied to it, we could safely use a design fiber stress of 34,000 pounds. As a matter of fact, in this country, when such material is used for boilers, a working fiber stress of only 11,000 pounds is permitted by the A. S. M. E. boiler code, while for the same material in locomotive boilers a stress of 12,200 pounds is permitted, and in England for stationary boilers 13,750 pounds is allowed. All of these are below the yield point of the material, but even the highest of them is nowhere near the yield point. The highest is 25 per cent greater than the lowest, and it may well be asked what reason is there for this 25 per cent variation.

I do not intend in any way to condemn the use of a factor of safety of 5 in boiler construction. My only purpose is to point out that our factors of safety are not based on definite knowledge that we rightfully should have. It is probable that the factor of safety of 5 used in boiler construction is on the safe side.

A certain amount of ductility is necessary in any structure subjected to unknown stresses, although we have no definite information as to the minimum amount required. In ordinary steel construction work (not structural steel so called), it may be said as a general rule the factor of safety used in design is 5. In the case of structural steel in buildings, the usual factor of safety is about 4, and 16,000 pounds is the usual design fiber stress. This is considered by many engineers to be lower than is necessary, and there is a strong movement to increase it to 18,000 pounds. But let us assume for the present purpose that the customary factors of safety are all right, and that it is not desirable to change them.

In welded construction in which mild steel is used, the same problems

of design are encountered as with other types of joints. Assuming that proper procedure is followed in making, for example, a welded pressure vessel, we can have no doubt as to the tensile strength of the weld metal or of the base metal, because these easily can be determined by the tensile test. In general tensile strength runs from 45,000 to 75,000 pounds per square inch, depending on the welding rod and process used, and this refers to welds that have not been heat treated. With mild steel plate, then, there is evidently no difficulty in obtaining sufficient tensile strength in the weld to break the plate.

It should also be understood that these figures refer to tests made with the reinforcement on the welds ground off. We are concerned only with the strength of the weld metal. If a welded test piece with no reinforcement breaks outside the weld, it is obvious that the weld is stronger than the plate so we can use the breaking strength of the test piece (regardless of whether the rupture occurred in or out of the weld) for our present purpose.

The measurement of the real ductility of weld metal is impossible in an ordinary welded tensile test piece, because the yield point of the weld metal in mild steel, when its tensile strength approximates that of the plate, is always higher than the yield point of the plate, so that during the tensile test the base metal elongates and begins to neck down before the weld metal.

There is no great difficulty in bending test pieces ½ in. thick in an ordinary heavy vise, but with thicker material the facilities usually at hand are not sufficient. In such cases, a piece is taken from the top of the weld or the bottom, or both, of suitable thickness, say ⅜-inch.

It is common, although not universal, to record in a tensile test the per cent, reduction of area, and many engineers believe this is a better measure of ductility than the elongation as usually given. It is interesting to note that the bend test combines both the elongation and reduction of area, and for this reason is a better measure of the ductility, in my judgment, than pure elongation. After all the elongation measured in 2-inch or 8-inch, does not give a true idea of the ductility of the metal. In an 8-inch test piece, the original inch in which the greatest elongation takes place may have stretched in mild steel as much as 90 per cent, while the total elongation may be 30 per cent. The elongation also depends on the geometry of the test piece. The reduction of area, taking place in a short distance, is not subject to these variations, so that any test that includes even a portion of the usual reduction of area, gives, to my mind, a fairer measure of the ductility than the result that is based on the usual elongation figure. I believe this to be true, not only of weld metal but of all metals.

In any case, the bend test seems to be the only method by which the ductility of the weld metal can be determined with reasonable accuracy, so that if the results of this test could be combined with tensile strength in some way, it would seem that reasonable decisions could be made as to the proper fiber stresses that could be allowed in welds of different kinds.

As there seems to be no theoretical basis for a working fiber stress, it is necessary at present to depend on practical results for the development of any formula that would be used for the purpose. If we know that certain fiber stresses have been used successfully with welds of certain tensile strength and elongation as measured by the bend test, we can create a formula to cover the results. But an additional element of accuracy that it is fair to consider, is the opinion of engineers based on their experience as to allowable fiber stresses for different kinds of welds. The tensile strength and elongation of such welds can be determined and the formula checked against them.

It would also seem fair that the formula should take account of ductility in such a way that a lower working fiber stress would be allowed where the material has low ductility, and that the working fiber stress should depend directly on the tensile strength.

Such a formula has been devised by A. B. Kinzel*, and is as follows:

$$S = \frac{T}{7.15}\sqrt[3]{\frac{E}{10}}$$

in which S is the allowable working fiber stress, T the ultimate tensile strength, and E the percentage of elongation as determined by the bend test previously mentioned.

Using different values for T and E, Table I has been prepared. The factor of safety in the last column is the same for any given percentage of elongation. The ultimate strength is either that of the weld metal if the weld breaks during the test, or of the

Table II

Modification of Table I According to Plan of Pressure Vessel Code

Ultimate Strength in Thousands of Lbs. per Sq. In.

Per cent elongation by bend test	Over 45 up to 50	Over 50 up to 55	Over 55 up to 60	Over 60 up to 65	Over 65 up to 70	Over 70 up to 75	Over 75
5 to 7½	5,400	6,000	6,500	7,200	7,700	8,300	8,900
Over 7½ to 10	6,000	6,700	7,300	8,000	8,700	9,300	10,000
Over 10 to 12½	6,500	7,300	8,000	8,700	9,400	10,100	10,900
Over 12½ to 15	7,000	7,800	8,500	9,300	10,100	10,800	11,600
Over 15 to 17½	7,400	8,200	9,000	9,800	10,700	11,400	12,300
Over 17½ to 20	7,800	8,600	9,500	10,300	11,200	12,000	12,900
Over 20 to 22½	8,200	9,100	9,900	10,800	11,600	12,500	13,400
Over 22½ to 25	8,500	9,400	10,300	11,200	12,100	13,000	13,900

Table I

Proposed Maximum Working Fiber Stresses of Plates for Welded Pressure Vessels

Per cent elongation by bend test	Ultimate strength in thousands of Lbs. per Sq. In. 45	50	55	60	65	70	75	Factor of safety
5	5,000	5,600	6,100	6,700	7,200	7,800	8,300	9.0
7½	5,800	6,400	7,000	7,700	8,300	8,900	9,600	7.8
10	6,300	7,000	7,700	8,400	9,100	9,800	10,500	7.15
12½	6,800	7,600	8,300	9,000	9,800	10,500	11,300	6.65
15	7,200	8,000	8,800	9,600	10,400	11,100	12,000	6.25
17½	7,600	8,400	9,300	10,100	11,000	11,700	12,700	5.9
20	8,000	8,800	9,700	10,600	11,400	12,300	13,200	5.7
22½	8,300	9,200	10,100	11,000	11,800	12,800	13,700	5.5
25	8,600	9,500	10,500	11,400	12,400	13,200	14,200	5.3

*Member of the staff of the Union Carbide & Carbon Research Laboratories, Long Island City, N. Y.

base metal if the fracture occurs in it, and obviously a structure cannot be designed, as far as tensile strength is concerned, except on the strength of the weakest part. It is easily worked out that a factor of safety of 5 is reached at an elongation of somewhat over 29 per cent.

Any change in the constant, 7.15, would change the fiber stress in direct proportion. For instance, if 7 were taken instead of 7.15 the difference would be only 2 per cent, which is of practically no effect. The only reason why 7.15 was used is because it fits more closely the results of the tests on which the formula is based.

The part of the formula covering the factor of elongation decreases the allowable working fiber stress more rapidly than the elongation decreases, and on the other hand, increases the the fiber stress more slowly than the elongation. This seems logical, because there must be a point beyond which an increase in elongation increases the value of the metal but slightly, and because as the brittleness increases the metal becomes less reliable in service.

It may be asked why some other root than the cube root was not used in the preparation of the table. It is because the cube root seemed to fit the facts better than did any other.

With our rather conservative ideas as to the use of factors of safety, it looks as if the fourth root formula gave too low a factor of safety, and that if a weld were produced with 29 per cent elongation with 75,000 pounds ultimate strength, the factor of safety of 5 would not be unsafe, so that the cube root seems to be reasonable and to conform to general engineering ideas.

The allowable working pressure in the power boiler code is based on the minimum ultimate strength of the plate of 55,000 pounds per square inch, the efficiency of the joint, and a factor of safety of 5, so that 11,000 pounds is the allowable working fiber stress.

In the pressure vessel code, while the allowable fiber stresses are really based on a factor of safety of about 5 for riveted construction, a definite fiber stress of 10,000 pounds is permitted for plates less than 55,000 pounds ultimate strength, and 11,000 pounds for plates of 55,000 pounds or greater ultimate strength. So it might be feasible to simplify the table by adopting some plan similar to that in the pressure vessel code, and Table II is submitted as showing what might be done in this direction.

Also, it may be unnecessary to make such small steps as Table I shows when the factors of safety are as large as they are, and when the tanks are tested to three times the working pressure. It is also true, with welding as it is with riveting, that no two joints are exactly the same, and that allowable commercial differences in welding rods will have some bearing on the physical properties of the weld metal. Therefore, some such form as Table II may be allowable.

In practice, proper procedure requires that the welders be tested. If the manufacturer had on file certified records of the welders, the inspector could check these records with the tanks that are being built, and by the use of the table could decide on the maximum allowable working pressure.

Table I gives higher values for welds than have ever before been presented for consideration, but no higher than have actually been used in practice with safe results in the cases on which the table is based. It is not believed that they can be used without proper procedure control, but it is felt that they are perfectly safe when such procedure control is followed in the construction of the tank.

It so happens that the allowable fiber stress at 50,000 pounds and 5 per cent elongation is 5600, the same as is used in the pressure vessel and heating boiler codes.

At the values of tensile strength and elongation of cast iron, say 20,000 pounds and 0.2 per cent, the formula gives a fiber stress of 750 pounds. As a common factor of safety for cast iron under shock is 20, the formula does not seem to be unreasonable at this extreme.

At the other end, we may take nickel steel that has been used for boilers. It has a tensile strength of 70,000 pounds and an elongation of 23 per cent (obtained by the tensile test and not by the bend test). The formula rating for this material is 12,900 pounds, and with a factor of safety of 5 it would be allowed 14,000 pounds working stress. Therefore, it seems that the formula is within reason and does not violate good practice, even at the extremes.

American Foundrymen Will Visit Many English Cities

OFFICIAL program of the international foundrymen's congress in London in May and June, 1929, is complete, except for a few details which may be revised.

The first party of American foundrymen, crossing on S. S. CARMANIA, is due to arrive in London Monday, May 20, and the second party travelling on S. S. BERENGARIA, is due to arrive Tuesday, May 21.

May 22 and 23 the visitors will be able to visit London at leisure, and during this period a reception will be arranged for delegates and ladies. Friday, May 24, there will be a sightseeing tour by motor-coach, during which places of interest will be visited. Saturday, May 25, there will be a whole-day excursion by motor-coach to Windsor, Hampton Court, and the environs. Sunday, May 26, will be passed at leisure in London.

The pre-convention tour will start Monday, May 27, when the delegates will go by train to Birmingham. They will visit the Shakespeare country and Warwick Castle. From Birmingham they will go to Derby and Loughborough, thence to Manchester and Liverpool. The next portion of the tour through the Lake district and the Scottish lowlands will be effected in saloon motor-coaches, which will bring the visitors to Edinburgh and from there to Newcastle, where they will arrive June 6. After visiting foundries and the North East coast exhibition in Newcastle, the visitors will proceed by motor-coach to Sheffield, and Sunday, June 9, the delegation will leave Sheffield, returning to London by rail.

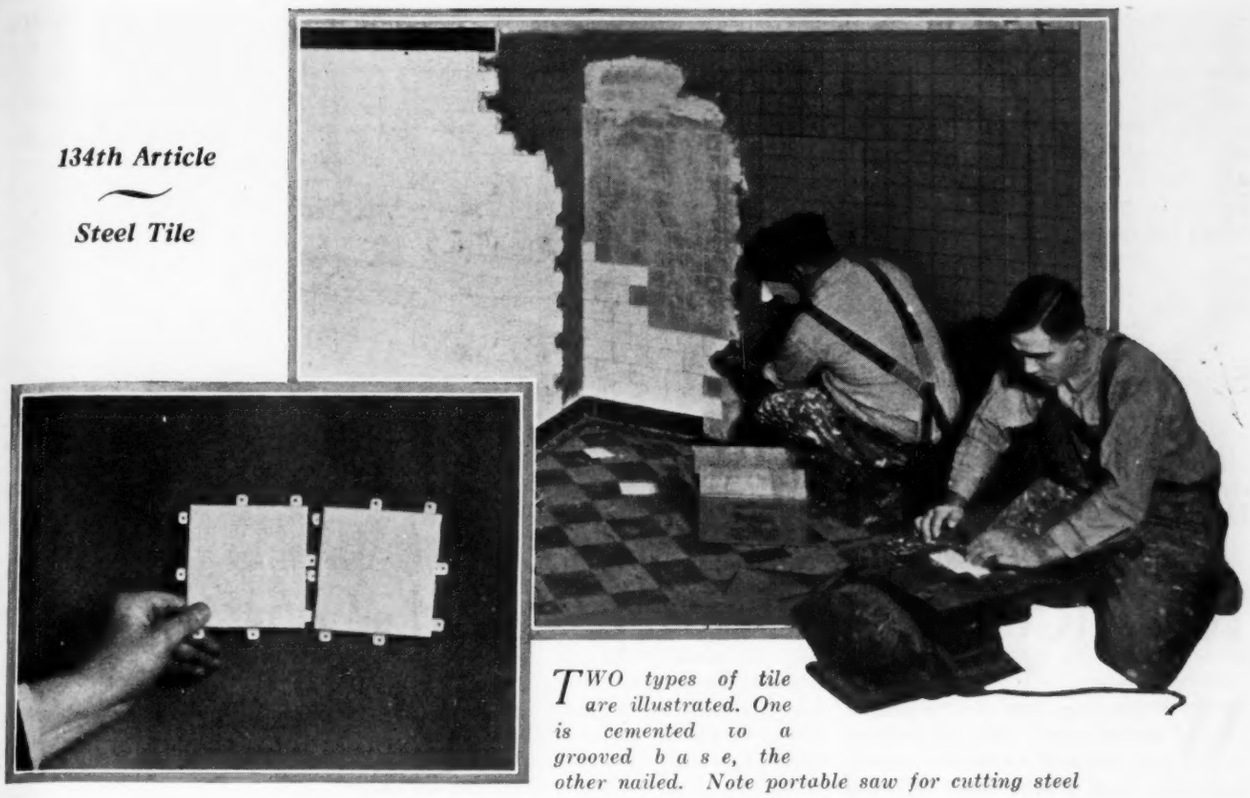
After spending the day of Monday, June 10, at leisure in London, the delegates will be officially received on the evening of Tuesday, June 11. The opening meeting of the conference and the technical sessions will begin Wednesday morning, June 12, and the sessions will last until Friday, June 14, the afternoons being devoted to visiting the foundry exhibition in London. During the convention in London there will be a number of luncheons and banquets, and various social events also will be arranged for the delegates and ladies. There will be a special program of entertainment for the ladies while the delegates are engaged at the technical sessions.

A list of the foundries and works to be visited in the principal districts will be announced soon.

Reed-Prentice Corp., Worcester, Mass., has declared a dividend of 50 cents on its preferred stock, the first since January, 1921.

134th Article

Steel Tile



TWO types of tile are illustrated. One is cemented to a grooved base, the other nailed. Note portable saw for cutting steel

Large Uses of Steel in Small Ways

DEMAND for steel wall tiles is increasing. A manufacturer who recently engaged in their production, and who has made a survey of the business and its possibilities estimates the total annual consumption of steel for wall tiles at 1000 tons. This does not include sheet steel which is stamped to imitate tiles, but the small units which in size and appearance closely resemble ceramic tiles. The steel is 20 to 24 gage, cold rolled. When the tiles are stamped out of the steel the edges are slightly flanged.

It was discovered years ago that steel could be coated with porcelain and that the porcelain could be fused into the steel at a temperature of 1600 degrees Fahr. It was learned that the porcelain became firmly and permanently adherent. The next question was how these tiles could be made so they could be fastened to the walls quickly, neatly and permanently. One maker cements his tiles to the walls by means of a special adhesive, nonhardening, elastic and waterproof. Another mounts his tiles by means of little ears or tabs, protruding from the edges. Some of the tabs are slipped under the edges of the adjoining tiles, the exposed tabs are tacked on—and so on until the wall is laid up. Other ingenious methods have been proposed.

One company uses zinc as a base for tiles. Makers of other materials, such as asbestos, are contending for popular favor. Some of these materials have a hard, enameled surface. They are marked into squares, to imitate tiles, and are tacked or cemented to the walls in sheets, similar to the old style of stamped sheet steel. Competition is continually developing; a small, composition tile, very beautiful, and so easy to apply that a novice can do the job, may appear soon, and throw another bomb into the new industry.

The ceramic tile industry long had a special field almost entirely to itself. Now it is conducting a national campaign, extolling the practical advantages and beauty of the genuine clay and porcelain article. Makers of steel tiles say theirs are more durable and look just as good as ceramic tiles; and, furthermore, that steel tiles do not show a lot of little, fine veins, or check marks so distressing to those having installed ceramic tiles, and also that steel tiles do not split clear across their surfaces as do some ceramic tiles. In addition, thereto, that steel tiles cost only 80 cents to $1.25 per square foot, installed, while ceramic tiles cost $1 to $2 or more.

Setting ceramic tiles has been a job for high-priced specialists, something entrusted only to those with artistic sense as well as skill in their trade. Along came practical steel tiles, that can be fastened to the walls by car-

THIS is the one hundred thirty-fourth of a series of articles dealing with some of the obscure uses of steel which go far toward absorbing the American tonnage.

Among articles appearing every two weeks and not included in Vol. I containing 51 separate descriptions are:

Swords
Paving Guards
Reaction Kettles
Fire Screens
Voting Machines
Display Racks
Steel Stamps
Wire Screens
Typewriter Spools
Chain Hoists
Newspaper-Vending Boxes
Wire Lamp Shades
Belt Fasteners
Sap Spouts
Bathroom Fixtures
Snow Fences
Stairs
Cork Screws
Universal Shafts
Sewing Machines
Lanterns
Cleats
Axes
Steel Ceilings
Card Tables
Welding Rods
Washing Machines
Resilient Road Guards

penters, or in some instances by laborers. While the specialists cemented or tacked the steel tiles to the walls, and then "pointed them up," that is, running plaster between the joints, all was well, but when the carpenters and other workmen took a hand in the job trouble sometimes ensued. The result has been that agencies handling some of the steel tiles now make a practice of installing them, with their own workmen.

Service Conditions Are Corrosion Factors

Prompted by the statement that the steel ship plate of the hull of the LEVIATHAN has shown in service marked superiority in its resistance to corrosion by sea water the bureau of standards, Washington, recently conducted a series of laboratory corrosion tests on this material together with a number of comparison steels among which was included some other ship plate. Results showed no important or outstanding difference in the corrosion behavior of the series of mild steels which could be considered as significant of variations in composition. It was found that the determining factor in the corrosion was the method by which the corrosive attack was brought about. The bureau concluded that differences in service conditions probably were the bases of the claims which have been made concerning the alleged superior quality of the ship plate in the LEVIATHAN hull.

Steel in Safety Conference

Representatives of iron and steel companies will participate in the program of the northern Indiana industrial safety conference, Fort Wayne, Feb. 15. J. M. Woltz, Youngstown Sheet & Tube Co. will speak on "Plant Housekeeping"; Dr. W. B. Fisk, International Harvester Co., Chicago, on "Placement of Men from Accident Prevention Standpoint," and G. A. Kuechenmeister, Dominion Forge & Stamping Co., Walkerville, Ont., on "The Foreman's Opportunity." J. B. Gibson, Western Electric Co., Chicago, will speak on "Safety Programs That Work."

Refractories Group Will Co-operate

WIDE interest in research work was shown by the American Ceramic society and more than a half dozen affiliated groups during the ceramic week exposition and convention Feb. 4 to 9 at Hotel Stevens, Chicago. One of the important results of the meetings was the federation of the American Refractories institute and the refractories division of the American Ceramic society.

The two groups will combine in sponsoring research activities and technical work in broader co-operation than heretofore. Technical papers of the American Refractories institute will be published and distributed to the membership of the refractories group of the ceramic society. The refractories institute, however, will continue its separate identity for the purpose of carrying on much of the work that has characterized this organization in the past.

E. H. Van Schoick, of the Chicago Retort & Fire Brick Co., Chicago, was elected chairman of the refractories division of the ceramic society for 1929-30, and J. S. McDowell, Harbison-Walker Refractories Co., Pittsburgh, was chosen head of the 1929-30 nominating committee. George A. Bole, of Columbus, O., in charge of ceramic research at Ohio State university, was elected president of the American Ceramic society.

M. C. Booze, retiring president of the ceramic society, was among those urging the federation of the refractories groups. "We are confident that the idea can be extended broadly with equally good results. Pressure can be exerted to obtain larger government appropriations for ceramic work and equitable recognition can be obtained," said Mr. Booze. "Tariff, legislative and traffic matters can be dealt with better as a group than as individual associations."

The exposition was divided into the finished products group, including exhibits of ware and education work and pottery making, and the industrial equipment group. Thirty-seven booths comprised the exhibits of ware and terra cotta, and 75 exhibits displayed industrial equipment.

Link-Belt Co., Chicago, featured in glass enclosed cabinet its so-called silent chain paradox, and exhibited a herringbone speed reducer, Sykes tooth form and elevating, conveying and power transmission chain samples and belt conveyor idler assemblies. Interesting photographs showed heavy equipment. Abrasive Co., Philadelphia, displayed grinding materials and implements used for abrasive work in various branches of the industry. Bucyrus-Erie Co., South Milwaukee, Wis., featured a transparency case with more than 60 photographs of installations of the Bucyrus-Erie shovels in pit work in various parts of the country.

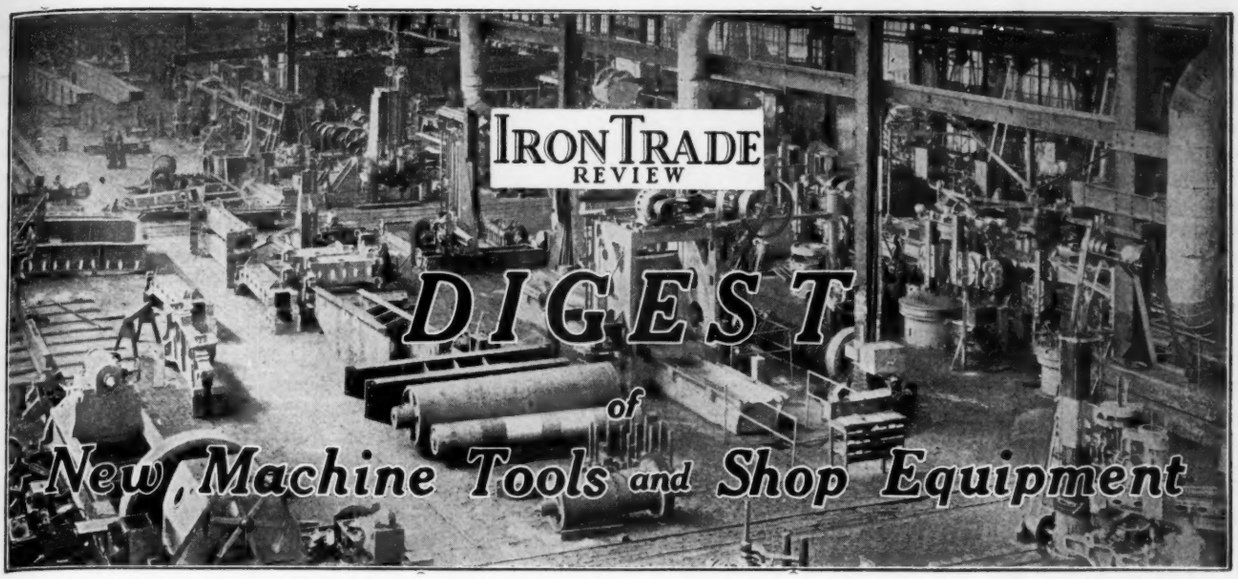
American Gas association featured a new type of waterless gas holder. Patterson Foundry & Machine Co., East Liverpool, O., exhibited laboratory pebble mills in operation, and Precision Grinding Wheel Co. Inc., Philadelphia, showed application of the various types of grinding wheels, segments and special shapes used in the cutting, grinding and shaping of ware. Brown Instrument Co., Philadephia, exhibited flush type instruments on black metal panel boards, including resistance themometers, four record recording strip chart pyrometers, portable pyrometers and potentiometers, flow meter forged steel manometer, and recording ingrating flow meter. Carborundum Co., Niagara Falls, N. Y., showed a muffle porcelain enameling furnace, and reproductions of kilns. Clark Tructractor Co., Battle Creek, Mich., showed a special design lift truck and also the autodump truck-tractor. American Dressler Tunnel Kilns Inc., Cleveland, featured photographs, slides and literature showing successful installations of Dressler tunnel kilns.

Other exhibitors included New Castle Refractories Co., New Castle, Pa.; W. A. Riddell Co., Bucyrus, O.; Thew Shovel Co., Lorain, O.; Norton Co., Worcester, Mass.; Dings Magnetic Separator Co., Milwaukee; General Electric Co., Schenectady, N. Y.; Leeds & Northrup Co., Philadelphia; Marion Steam Shovel Co., Marion, O.; Mueller Bros., St. Louis; and others.

Offer $500 for Slogan

The National Electrical Manufacturers association and the National Electric Light association are offering $500 in seven prizes for the best slogans to promote the use of electric heat in industry. Slogans must be submitted to the former association at 420 Lexington avenue, New York, by May 30.

Wright Aeronautical Corp., Paterson, N. J., has booked 250 Wright J-6 airplane motors, costing $1,200,000, for the Ryan-Mahoney Aircraft Corp., Lambert-St. Louis flying field, St. Louis.

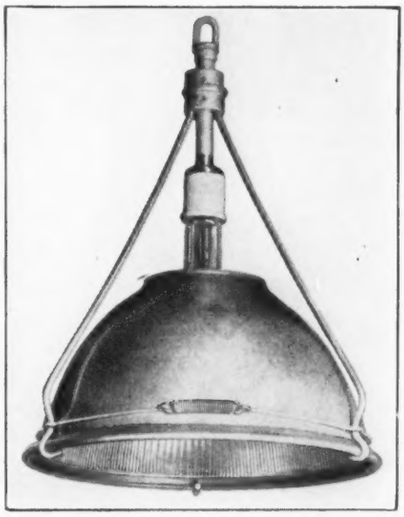


Lighting Unit for High Bay Illumination

No. 29

The Holophane Co., Inc. 342 Madison avenue, New York recently brought out a new type lighting unit designed especially for high bay lighting. Construction is shown in the accompanying illustration. The reflector is made of prismatic glass and the reflecting surface of the prisms is protected from dust and dirt by an aluminum cover which is permanently spun on the reflector. The inside exposed surface of the reflector is smooth crystal glass and can be cleaned easily. A large top opening provides adequate ventilation and offers a by-pass for dust that otherwise would settle on the lamp bulb.

The reflector is held by a three-prong adjustable holder that operates on the ice hook principle so that there is no possibility of the reflector falling if struck. An added protection is given by a retaining ring which also serves to maintain the lamp in the exact center of the reflector. The ¾-inch conduit stem is calibrated for lamp sizes from 300 to 1500 watts, so that the correct lamp position can be obtained by shutting the sliding collar against the corresponding lamp size marking on the stem. The holder is finished cadmium plate.



No. 29—High bay lighting unit

The degree of concentration of the light into the lower angles depends on the ratio of spacing to mounting height. The new unit can be adjusted to give relatively wide, medium and narrow spreads for ratios of spacing to mounting height of 1.25, 1.00 and 0.75.

Develops Improved Board Drop Hammer

No. 30

Chambersburg Engineering Co., Chambersburg, Pa., announces various improvements in its model H board drop hammer. The heat treated alloy steel front rod operates between roll-

Iron Trade Review's Calendar of New Equipment

Item	Comment	Builder	No.	Date Described	Page
Vise	Chain pipe vise with overhead adjustment	J. H. Williams & Co.	11	Jan. 24	272
Grinding machine	Centers will handle work 72 inches in length	Brown & Sharpe Mfg. Co.	12	Jan. 24	272
Welder	Small electric arc type; operates from alternating current	J. C. McAdams Co. Inc.	13	Jan. 24	272
Electric motor	Totally enclosed, fan-cooled; squirrel-cage type	Westinghouse Electric & Mfg. Co.	14	Jan. 24	273
Saw	Circular metal cutting saw; cuts tubing and formed metal	DeWalt Products Corp.	15	Jan. 24	273
Switch	Push-button type for motor starter control	Lincoln Electric Co.	16	Jan. 31	328
Gear cutter	New features incorporated in automatic machine	Brown & Sharpe Mfg. Co.	17	Jan. 31	328
Crawler crane	New boom style; crane, clamshell, dragline or shovel	Thew Shovel Co.	18	Jan. 31	329
Switch	Radial rheostat type for varying field currents	General Electric Co.	19	Jan. 31	329
Coupling	Air hose coupling; 1-inch diameter; light weight	Robinson Machine Co.	20	Jan. 31	329
Switches	Magnetic starting and protective switches	General Electric Co.	21	Jan. 31	329
Drive fittings	High-pressure type; installed in open oil holes	Alemite Mfg. Co.	22	Feb. 7	400
Blowpipe	For welding work on airplane fuselages	Oxweld Acetylene Co.	23	Feb. 7	400
Crane	Locomotive type; gasoline, diesel or electric drive	Link-Belt Co.	24	Feb. 7	400
Stoker	Multiple retort underfeed stoker	Combustion Engineering Corp.	25	Feb. 7	400
Wrenches	Socket wrenches made up into several sets	Blackhawk Mfg. Co.	26	Feb. 7	401
Electric control	Time-current principle; 250 volts or less	Electric Controller & Mfg. Co.	27	Feb. 7	401
Grinder	Full automatic reversible cup wheel grinder	Samuel C. Rogers & Co.	28	Feb. 7	401
Lighting unit	For high bay lighting; reflector of prismatic glass	Holophane Co. Inc.	29	Feb. 14	469
Drop hammer	Improved accuracy and operation on board drop hammer	Chambersburg Engineering Co.	30	Feb. 14	469
Floor charger	Auto electric type; serves heating furnaces, presses, etc	Edgar E. Brosius Inc.	31	Feb. 14	471
Taps and dies	Collapsing taps and opening dies with removable chasers	National Acme Co.	32	Feb. 14	471
Buckets	Digging and rehandling buckets; variety of sizes	Owen Bucket Co.	33	Feb. 14	472
Exhauster	For grinding and polishing machines; motor driven	Hisey-Wolf Machine Co.	34	Feb. 14	472
Woodworking machine	Portable electric; 29 different cutting operations	DeWalt Products Corp.	35	Feb. 14	472

ers with both ends of its stroke cushioned. Quiet operation is secured by actuating the front rod by a true sliding cam. Improved pedal construction also makes for easy operation. The 20-1 anvil receives the blow solidly. The large roll clearance, the perfected clamp and the adjustable guides eliminate drag on both ram and boards. The result is greater impact per blow and more blows per minute.

The unusually long frame seats have an I-beam section and are made without cores. They provide a solid anvil bearing. The stepped, long guided joint overcomes the tendency to twist or rock. As compared with former models the bearing area is increased 80 per cent, the thrust area 100 per cent and the resistance to twist 100 per cent.

The patented stepped and tongued frame seats of the anvil play an important part in the increased accuracy of forging. The male tongues of this seat are on the anvil, so that when the anvil gets hotter than the frame, during operation, the expansion of the tongues will maintain proper fits with the frames. A breather hole under each seat prevents accumulation of scale that would interfere with the fit. Wearing plates on the side of the tongues can be renewed without disturbing any other hammer part.

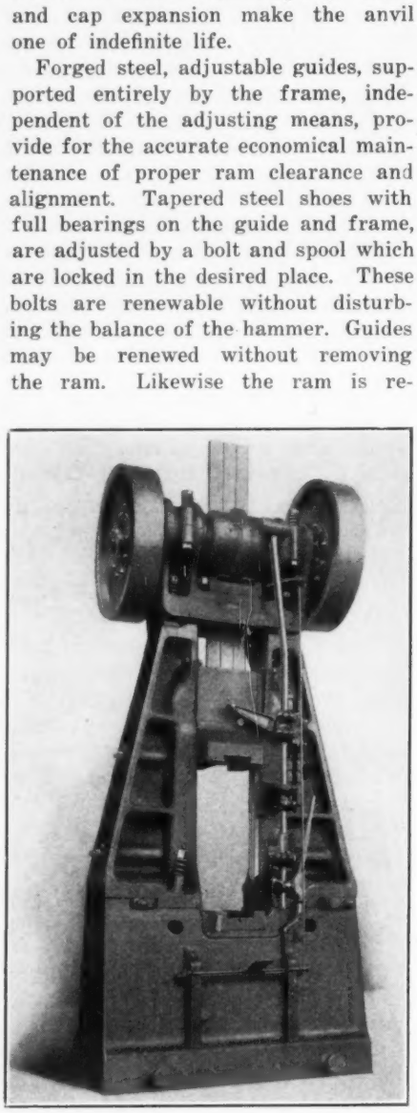
Precise die adjustment, without sacrificing guide clearance, is made possible by the micrometer scaled, forged steel, adjusting wedges. The alloy steel frame to anvil bolts terminate above the floor and are held by nonfreezing keys. Ample strength to resist overload from impact, thrust and cap expansion make the anvil one of indefinite life.

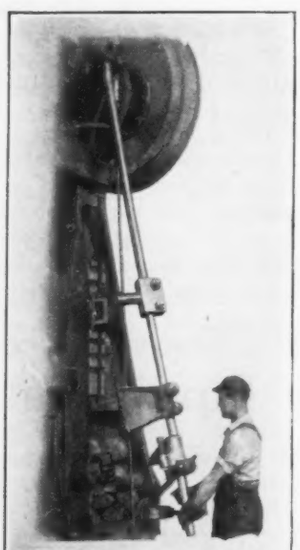
Forged steel, adjustable guides, supported entirely by the frame, independent of the adjusting means, provide for the accurate economical maintenance of proper ram clearance and alignment. Tapered steel shoes with full bearings on the guide and frame, are adjusted by a bolt and spool which are locked in the desired place. These bolts are renewable without disturbing the balance of the hammer. Guides may be renewed without removing the ram. Likewise the ram is removable over the tops of the adjustable guides.

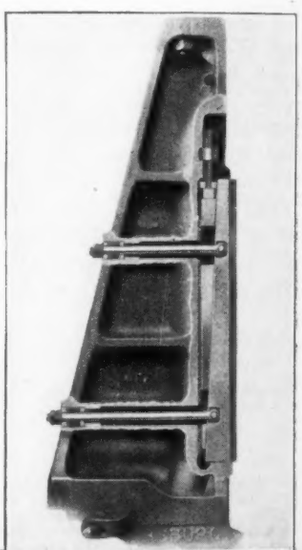
In addition to maintaining frame alignment in all planes the interlocking tieplate protects the head. Twisting strains are absorbed in the tieplate and accidental over-travel of the ram is prevented from damaging the head assembly. The destructive force of impact is absorbed in the air and oil spaces between the laminated buffers of the tieplate.

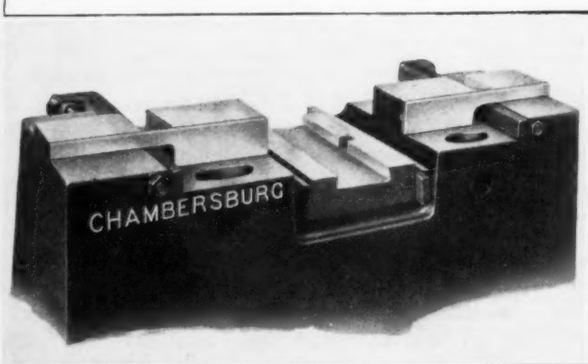
By removing the pullback roller and pin, and rolling the release lever from its bracket, the front rod is freed to swing outward for the renewal of any part. Such changes can be made in 1/10 of the time formerly required. The front rod is heat treated alloyed steel. Tapered, keyed connections with slotted jam nuts to take up lost motion, have replaced all square clamped connections.

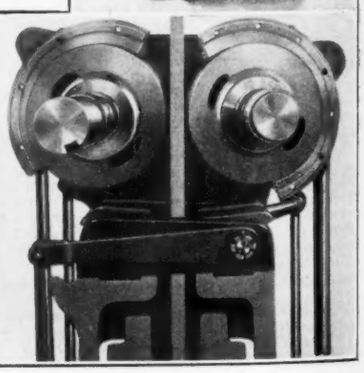
The front rod operates between two hardened steel rollers. The lower roller and the pullback bear on the rod. A hardened tool steel track inserted in the clamp, its upper end butting against the stop, contacts on the upper roll which is supported by the frame. In the top position the track rests on this roller and is cushioned against the stop. The stop slides on the front rod, attached to the clamp by spring balanced bolts. In the down position this stop con-











NO. 30—Front view of improved board drop hammer is shown above. Other illustrations, following around from left to right show: Accessibility of front rod; oil reservoir in head; 20:1 steel anvil; section through center of head; and adjustable guides

tacts on nonmetallic cushions which can be added to or reduced to suit the boards. The large cushion area in contact with the stop insures long life. The board rolls are mounted on large heat treated alloy steel shafts, kept in parallel alignment by roller bearings. The increased clearance between the rolls and the board, and the full floating clamp, assures complete freedom of the board on the down stroke. Greater throw in the eccentrics permits longer use of the boards. The rolls are ventilated; cooled rolls operate with less friction. Longer board life is secured because the large sized rolls used squeeze rather than penetrate the board.

Oil for lubricating the roller bearings of the roll shafts and eccentrics is stored in a reservoir formed in the head. Any overflow is carried to the outside of the head. The bearings are sealed at the inner ends so that proper lubrication is certain without leakage to the boards.

A safety pedal, needing no guard, replaces the former pedal which extended across the anvil face. The pedal is made inoperative by merely turning it back against the anvil, avoiding the hazard of accidental tripping. It can be adjusted to the most comfortable position to the hammerman.

The increased roll shaft diameter, and the use of heat treated alloy steel, practically removes the hazard of falling pulleys. The patented front rod lever automatically locks when used to raise the front rod. It requires two hands to release it. Safety lugs prevent cocking and falling of the ram, should it accidentally ascend above the guides. The tieplate forms a stop for ram overtravel.

Auto Charger Requires Small Floor Space

No. 31

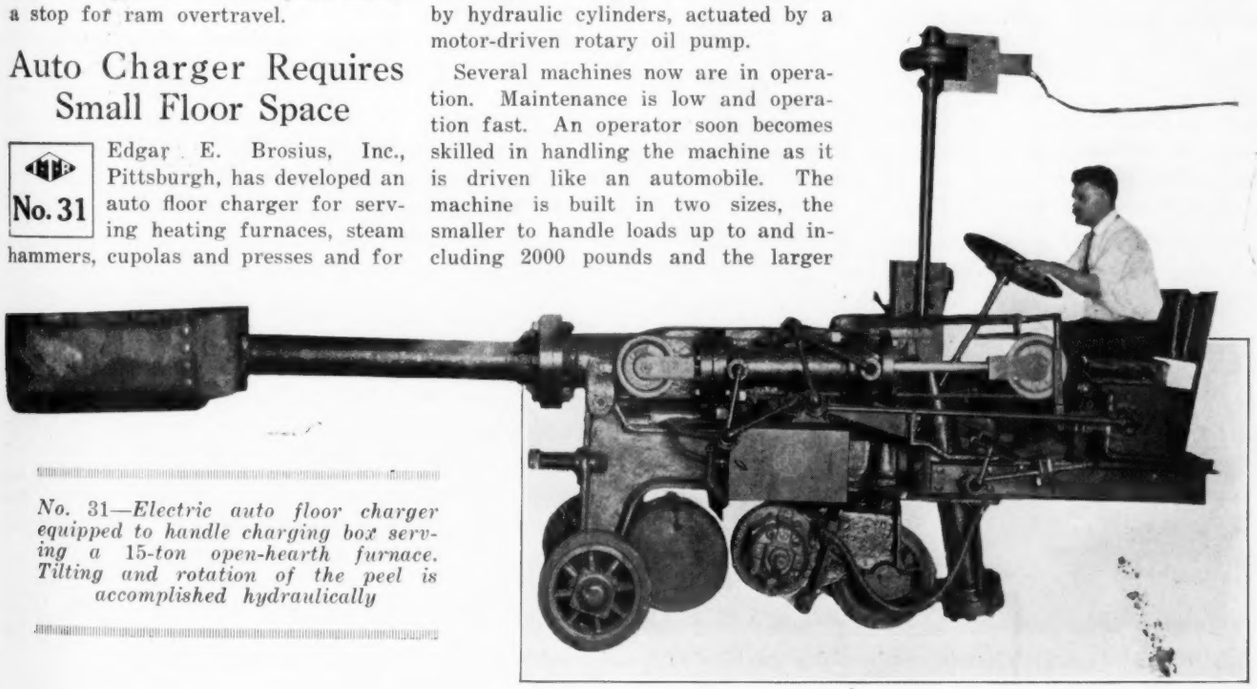
Edgar E. Brosius, Inc., Pittsburgh, has developed an auto floor charger for serving heating furnaces, steam hammers, cupolas and presses and for charging open hearth furnaces. The accompanying illustration shows a machine built to handle open hearth charging boxes.

Numerous features have been incorporated in the design. Small floor space is required for its operation; it is mounted on rubber tires; the tractor wheel is driven through spur gears by a motor mounted on the tractor; and, the machine is steered through a pair of bevel gears by a standard automobile truck steering wheel. The tractor is mounted on a vertical shaft supported by Timken roller bearings and can turn at right angles, thus allowing the unit to turn in its own wheel base.

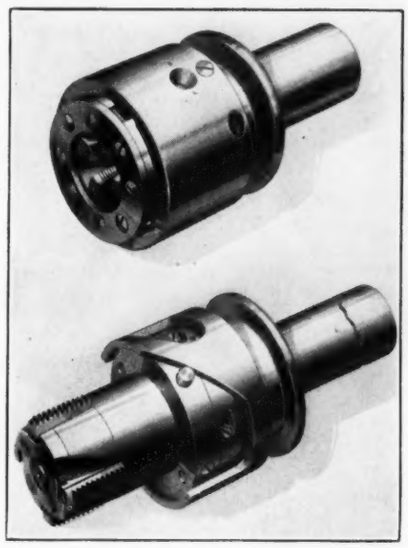
The front wheels are equipped with roller bearings and the tilting and rotating of the peel is accomplished by hydraulic cylinders, actuated by a motor-driven rotary oil pump.

Several machines now are in operation. Maintenance is low and operation fast. An operator soon becomes skilled in handling the machine as it is driven like an automobile. The machine is built in two sizes, the smaller to handle loads up to and including 2000 pounds and the larger which will maneuver double this load.

For handling billets, ingots, etc., a peel with conventional type tongs is provided in place of the rotating peel as shown in the illustration. The machine can be operated on either direct or alternating current. Patents are pending or allowed in this country and foreign countries.



No. 31—Electric auto floor charger equipped to handle charging box serving a 15-ton open-hearth furnace. Tilting and rotation of the peel is accomplished hydraulically



No. 32—New tap and die design

Introduces Opening Dies and Collapsing Taps

No. 32

National Acme Co., Cleveland, is introducing new opening dies and collapsing taps with quick removable chasers. The dies have been designed to supplement rather than replace the regular line of the company's opening dies. The opening in the front plate of the new die has been made as large as possible to permit close to shoulder threading on ordinary standard screws. Chasers can be changed instantly. A positive cam action is provided for collapsing the chasers. Positive adjustment is effected by two opposed screws which are self-locking. All parts are hardened and ground throughout. The open core piece and front plate allow fine dust, chip particles, heavy oil accumulation, etc., to be blown from the taps by compressed air.

The new collapsing tap is designed for cutting threads that are accurate and true. The design is such that no chips or dirt can find their way to the interior, except by actual working through bearing surfaces. A free flow of oil through the die head washes away all grit and dirt, and allows the chasers to perform their

work in an uninterrupted manner, while in the case of the tap, air can be blown through to thoroughly clean the tool. The revolving type of opening die head is made to take five different sized taps ranging from 7/16-inch to 1⅝ inches. Both the stationary and revolving type collapsing tap is made to take six sized taps ranging from 2¼ to 4⅝ inches.

Announces Digging and Rehandling Buckets

No. 33

Owen Bucket Co., Cleveland, are introducing two improved types of buckets, one for rehandling and the other for digging. The rehandling bucket has been designed for maximum output when rehandling loose or compact materials. Due to its width and length when opened, it is particularly efficient for cleaning up materials loaded to shallow depths over large areas. It is recommended for unloading barges, flats, cars and for stock pile work.

The bucket is made in standard, heavy and special models to suit requirements. Some of the important features include: one-piece steel crossheads; concentration of weight located on the centershaft; sealed centershaft bearings; rigid shell construction with minimum number of parts; proper reinforcement; and long life sheaves and cables.

The heavy duty bucket, shown in the accompanying illustration, is designed for extra heavy digging and handling or for any work that subjects the bucket to excessive and severe strains. It is of exceptionally strong construction throughout. Some of the exclusive features are: one-piece extra heavy renewable jaws, grit-proof lubricated bearings, concentration of weight low in the construction for greater digging power, and the Owen method of stopping the jaws at a fixed open position to absorb dropping shocks.

The buckets are made in standard, extra heavy and narrow models to suit every difficult digging problem. They are particularly efficient and durable for work in stiff clay, ore, broken rock, slag or shale.

No. 33—Heavy duty bucket

Exhauster Equipment is Built for Grinders

No. 34

Hisey-Wolf Machine Co., Cincinnati, is placing on the market a ball bearing motor-driven exhauster equipment suitable for grinders of 10, 12 and 14-inch wheel capacity and for polishing machines of 8, 10, 12 and 14-inch wheel capacity. An automatic starter controls both the exhauster and grinding or buffing wheel motors. The wheel housing is connected to the exhaust fan by flexible tubing.

Woodworking Machine Compact and Portable

No. 35

DeWalt Products Corp., Leola, Pa., recently has placed on the market a new all-purpose electric woodworking machine which operates on either alternating or direct current. The device is said to perform accurately and safely 29 distinct cutting operations including dadoing, routing, mitering, shaping, grooving, ploughing, rabeting, mortising, tenoning, gaining, etc. All work is handled from one side of the table whether cross cutting, ripping or shaping. With a 12-inch combination cross-cut and rip saw which is standard equipment, the machine rips 2-inch stock at the rate of 20 lineal feet per minute. Fitted on a wooden table, the complete unit weighs 235 pounds. Standard equipment includes also an adjustable guard that fits down to the work, as shown in the accompanying illustration, providing protection to the operator.

No. 35—Portable electric woodworking machine with universal motor

French Plan New England Pipe Foundry

Preliminary foundation work has been started on a $3,000,000 cast iron pipe foundry at Chelsea, Mass., for the Societe Anonyme des Hauts Furneaux et Fonderies de Pont-a-Mousson, of France. Stone & Webster, Boston, are the engineers.

Herbert Kennedy, of Herbert Kennedy & Co., New York, representing the French company in this country, states that the plant will have an initial capacity of 150,000 tons a year, and that the establishment of a plant in the United States was first conceived upon the occasion of a visit to this country by Marcel Paul, chairman of the board of the Pont-a-Mousson company, about two months ago. The proposed step has been actuated by the possibility of an increase in duty on cast pipe from abroad.

The plant, it is believed, will be the first in New England to be devoted to the production of the standard sizes of cast pipe. Its proposed initial capacity of 150,000 tons, will be the equivalent of about 10 per cent of the country's present annual rate of production. The company has been exporting here annually some more than half this amount in recent years.

Mr. Grandpierre, engineer for the Pont-a-Mousson interests, arrived in this country Feb. 8.

Will Address Scrap Men

William E. Humphrey, chairman of the federal trade commission, Washington, will be the guest and speaker at the annual banquet of the Institute of Scrap Iron and Steel Inc. at the Pennsylvania hotel, New York, March 7.

Little was known of cobalt until 1857 when Deville produced the pure metal.

Editorials

One Quarter at a Time

BECAUSE spokesmen for the iron and steel industry are loath at this time to forecast market conditions sixty to ninety days hence, financial editors and business reviewers are inclined to skepticism. They interpret silence as doubt. They are casting a shadow on what promises to be the best first quarter in history in production.

For production, not fresh buying or predictions, should be the gage of the first quarter. The great bulk of railroad tonnage, both rails and equipment, falls into the opening quarter. Automotive and implement manufacturers are preparing for the spring trade. Building steel demand has not yet opened up.

On this score, the present quarter rates close to 100 thus far. January set a monthly output record in both pig iron and ingots. February indubitably will see another ingot record hung up, while pig iron output is expanding. For most producers January has been the best month in three years, considering all phases. Not since the war has there been such a scarcity of semi-finished steel which is holding back the production of some finished lines.

The best minds of the iron and steel industry are never vocal at this season; they prefer to await the beginning of March and from that eminence are more willing to peer into the remaining three quarters of the year. Prognostications at this time would be merely shots in the dark; they would not stimulate business, and if bad news is ahead why hasten it?

Cleaning Castings Hydraulically

EVEN under the most favorable circumstances possible, the cleaning department of the average foundry is the most troublesome part of the plant. As a rule the labor turnover is high, the accident rate is excessive and the cost per ton of output is less susceptible to control than any other foundry operation. In the case of certain types of castings of small and medium size, improved equipment for tumbling, and sand blasting have helped to minimize these difficulties, but the cleaning of large castings still presents many stubborn problems. Sometimes brute strength and awkwardness present the only effective means of attack.

The hydraulic method of cleaning, whereby a stream of water at high pressure is played upon the casting, has been known for 20 years, but only recently has it been given serious consideration by foundrymen.

At the present time this method is being employed in a dozen or more casting plants, and efforts are being made to improve existing equipment and practice. In view of this activity the article on page 456, describing the procedure in a New England foundry, merits the attention of all foundrymen whose castings are adapted to cleaning by this method. Certainly the reported saving of $6000 annually should be an attractive inducement for careful investigation of the possibilities of hydraulic cleaning.

Other Uses for Industry's Unity

VOLUNTARY co-operation in self-government," is the department of commerce's characterization of the manner in which the iron and steel industry has gone along with the department's program for simplification and elimination of waste.

To this program the iron and steel industry has contributed notably and profited accordingly. The unity thus displayed suggests the possibility of an unbroken front in effecting other needed reforms, especially in the marketing of products, in order to insure the industry its rightful profit.

The extent to which competitors will co-operate when assembled around a table by a neutral and trusted interest has been amply demonstrated by the simplification conferences. As is widely known, no standards are effective until and unless ratified by a great majority of capacity. The simplified practice recommendation for wrought iron and steel pipe received the adherence of 99.79 per cent of the capacity of that industry. On woven wire fence the degree of adherence was 99 per cent, on range boilers 97.8 and on reinforcing bars 96.21 per cent.

No producer of iron and steel can visualize the perfect setup in manufacturing and marketing relationships without including some reforms which could be accomplished speedily by round table conferences, such as the department of commerce has conducted. What manufacturer of sheets and bars, for example, would not welcome the day when waiving of extras, based upon actual additional processing, would be ended.

It may be that with the driving force of the department of commerce removed, the leadership

will be assumed by the federal trade commission through its trade practice conferences. Already one is scheduled for reinforcing bars, and one on the foundry industry is in prospect. It has been demonstrated that industry will co-operate. Apparently only the impetus is required.

Factory Products Lead Exports

PRESTIGE of the United States in world trade now is founded more on exports of the products of manufacturing plants rather than those of farms. Exports of finished manufactures in 1928 reached a total of $2,259,000,000, which was 14 per cent larger than in 1927, while exports of raw foodstuffs represented the only group which declined in value last year. There was a decrease of 43 per cent in the quantity of wheat exported. This was during a year when the total of our export trade was the largest in record, outside the years 1916 to 1920, which were abnormal as to demands and prices.

Total exports reached $5,129,000,000, or 5.4 per cent more than in 1927. Imports amounted to $4,091,000,000, less than in either 1926 or 1927. If adjustments are made for price changes, the value of imports in 1928 is the largest in history. The balance of our merchandise trade amounted to over $1,000,000,000 for the first time since 1921.

Of the finished manufactures exported in 1928, automotive products accounted for two-fifths of the total, and machinery for one-fifth. The exports of iron and steel products totaled 2,862,997 tons, 31 per cent greater than in 1927, and the largest of any year since 1920. Imports increased to a total of 782,694 tons for 1928, a gain of 43½ per cent over 1927. The expansion in iron and steel exports was fairly general through the list of the various commodities.

Copper, a Pacemaker for the Metals

NOT since the World war has the copper market been so active as during the past ten days. Buying has been tremendous and the rapidity with which the price has advanced literally left the trade breathless at times. Seldom has this market witnessed a more spectacular week of trading. Strength in the metal market has not been confined solely to copper, however. Lead went up several points and talk of an advance in zinc became more pronounced. Tin also firmed up, although with usual fluctuations.

While it is probable that bullishness in copper sentimentally induced some strength in the other metals, the stronger tone in these markets was due mainly to individual internal developments. Both lead and zinc have experienced better demand, and while the situation in tin has not been so clear, consumption has been sufficiently large to neutralize the effect of exceptionally big supplies.

The metals, it would seem, are sharing in the prosperity of the steel industry. Not for years has the steel trade enjoyed such activity, nor such satisfactory returns on investments. The same is true of the metals, especially copper, producers of which today are enjoying a prosperity which seems fantastic in the light of other days. Fully 15 copper producers have either begun dividend payments or increased rates the past ten months.

Generally it is expected that the metals will continue in a strong market for some time. This seems warranted by the steady improvement in the statistical position of the various metals and the large prospective demand the next few months. And even were these supports less prominent, the markets undoubtedly would find fortification in the spirit of co-operation so manifest in the nonferrous metal industry.

Modernizing Railroad Shops Pays

RAILROADS are increasing their purchases of machine tool equipment. Inasmuch as few new shops are being erected, the inference is that the new tools are for replacement of obsolete units. Statistics show that purchases in 1928 by railroads representing 85 per cent of mileage included 205 more machines than were bought in 1927 by roads representing 88 per cent.

This is a most hopeful sign, for railroads and for machine tool builders. For many years the latter have complained that purchases for railroad shops have been made by officials whose knowledge and duties have been far removed from machine shop practice and knowledge, who bought by price and not by performance.

A western road once in stress of a strike placed some repair work with a machine shop and found to its amazement that the cost was a fraction of that incurred in its own shops. Modern equipment was the answer. Time-wasting rules have handicapped railroad shops in the past, but conditions causing this have been modified as the war has receded.

In 1928, 87 railroads bought 2377 tool units, compared with 2172 units bought in 1927 by 99 railroads. Generous purchases of grinding equipment and increasing use of material handling equipment show the trend to modernization.

Railroad efficiency in operation has been carried to a high plane and financial showing has been bettered. From the viewpoint of the machine tool manufacturer, the largest area for increased economy and efficiency is in the shops where equipment has outlived its day and merits replacement by money-saving, modern tools.

IRON TRADE REVIEW

Volume 84, Number 7 — Published Every Thursday

E. L. SHANER, Editor. — *J. D. PEASE, Advertising Director.* — *F. F. LIGHT, Circulation Manager.*

Wrench Parts Hardened by Heat Treating. Page 461.

A COMPLETE analysis of distribution of finished rolled steel products by principal consuming groups is featured in this issue of IRON TRADE REVIEW, beginning on page 451. It is the most comprehensive since this publication in 1922 originated the compilation of such statistics. The tonnage for 1928 is the largest ever subdivided. It is shown clearly how through losses by conversion steel ingot production amounting to 49,857,223 tons shrinks to 35,645,201 tons, when expressed in terms of finished rolled steel. Tonnages and percentages are worked out in detail.

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IRON TRADE REVIEW is published by the Penton Publishing Co., Cleveland, O. Member, Audit Bureau of Circulation; Associated Business Papers Inc.; and National Publishers Association. Branch offices: 1147 People's Gas Bldg., Chicago; 410 Traction Bldg., Cincinnati; 2203-2206 No. 220 Broadway, New York; 2148-49 Oliver Bldg., Pittsburgh; 24 California street, San Francisco; 1653 Pennsylvania avenue, Washington; and Boston. Foreign offices: Prince's Chambers, Birmingham, Eng.; Caxton House, Westminster S. W. 1, London; 9 Rue de Londres, Paris, France; Wilhelmstrasse 114, Berlin, S. W. 48, Germany; cable address: *PENTON*, Cleveland; *ITROTRAPEN*, London. Terms: Subscription in United States, Cuba and Mexico, $6 per year; in Canada, $8.50 per year and in Great Britain and other countries £2:0:0 per year. *Entered at the Postoffice at Cleveland as Second Class Matter.* *Copyright 1928 by the Penton Publishing Co.*

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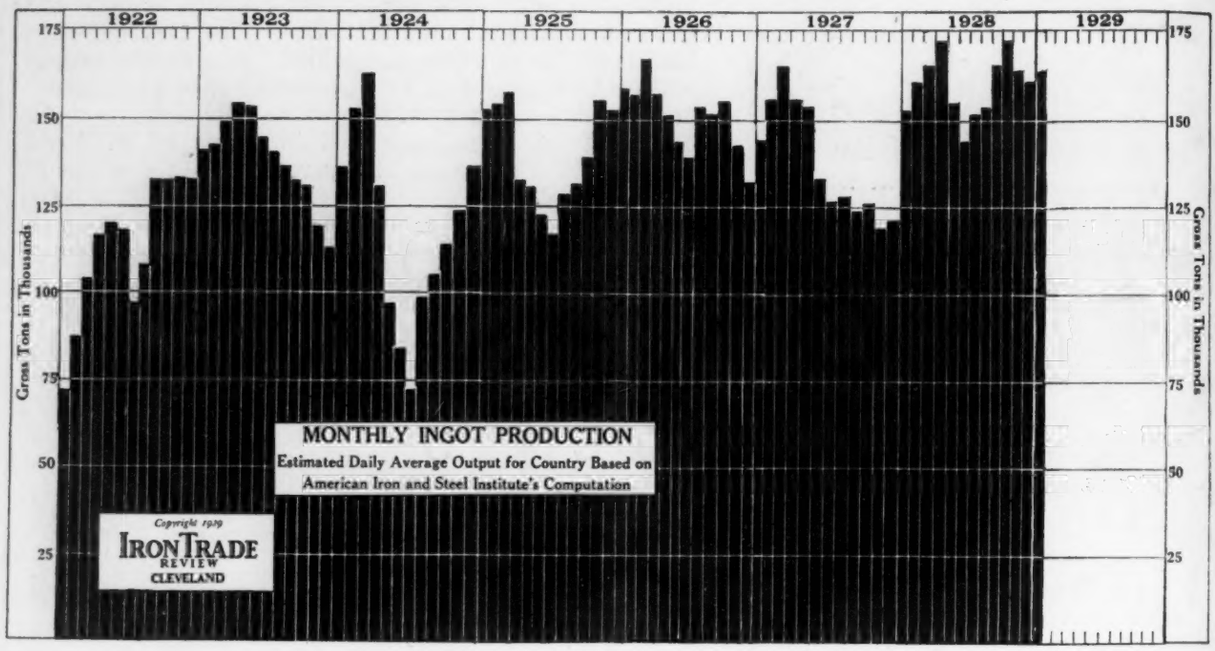
The Business Trend



Industry Active Despite Credit Developments

By JOHN W. HILL Financial Editor,

THE production of steel ingots in January reached a daily average of 166,274 tons, the greatest total for any January in history. Thus did the steel industry continue its record-breaking production schedule of 1928 into the new year. Pig iron output in January likewise was without precedent for that month.

STEEL ingot production broke eight monthly records in 1928, while the final result for the year of 49,857,223 tons was without equal. The January showing compared with 160,617 tons daily average in December and 153,513 tons in January, 1928. Operations averaged 88.2 per cent of capacity, the highest since last October, when a peak of 91.3 per cent was touched.

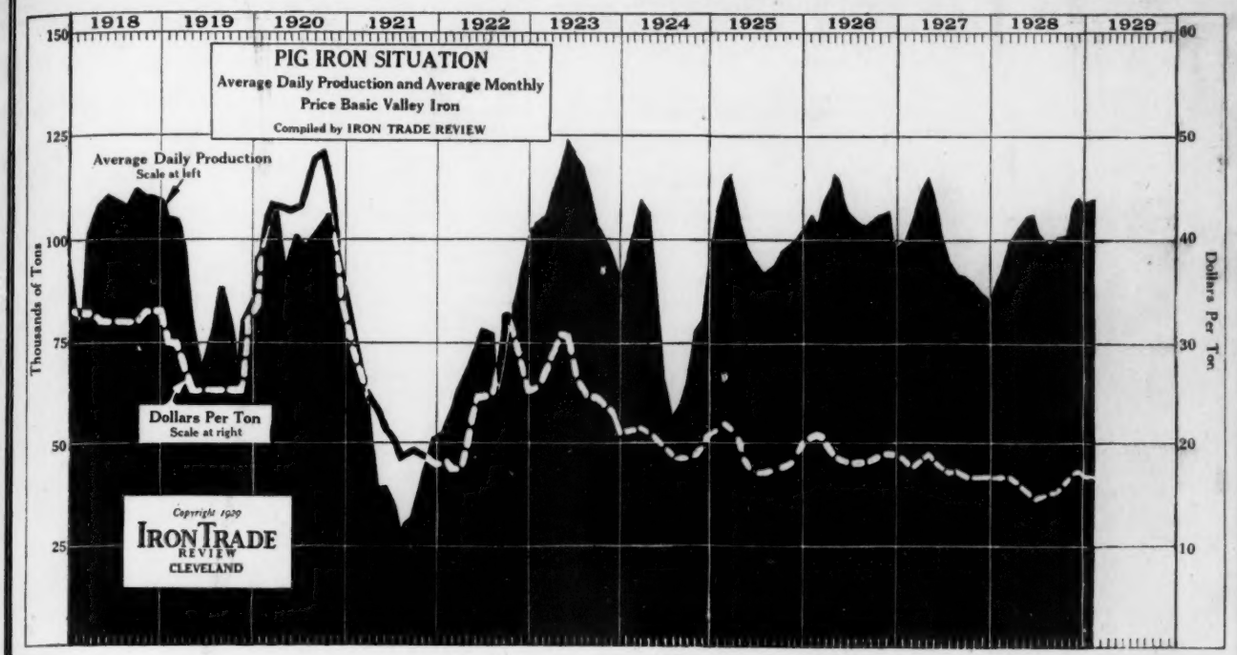
OPERATIONS at this level in the iron and steel industry unmistakably reflect a high rate of activity in industry generally. This is borne out by evidences in other directions. Coal production in January bounded back to the largest total since early 1927, before the outbreak of the strike in the bituminous coal fields. Automobile production has climbed and railroad traffic has shown a large increase over the December figures.

WHILE industry is moving ahead so vigorously important events have been taking place in the realm of finance. Following months of hints and indirect efforts to check huge credit expansion caused by the extraordinary wave of speculation, the federal reserve board last week came out with an open warning against further credit extension to finance security speculation.

BROKERS' loans have mounted to record levels and interest rates are high. The federal reserve board maintains it must check excessive absorption of credit by Wall Street to protect business against further increases in commercial rates of interest.

MUCH opposition to the federal reserve policy already has appeared. It is pointed out that much of the increase in loans for speculation has come from advances made by individuals and corporations. This class of loans has increased from $1,100,000,000 to $2,600,000,000 in a year. Moreover, relatively to the country's wealth, speculative activity is not now as great as it was early in the present century. Meanwhile, neither stock market fluctuations nor firm interest rates have adversely affected business, as yet.

The Business Trend

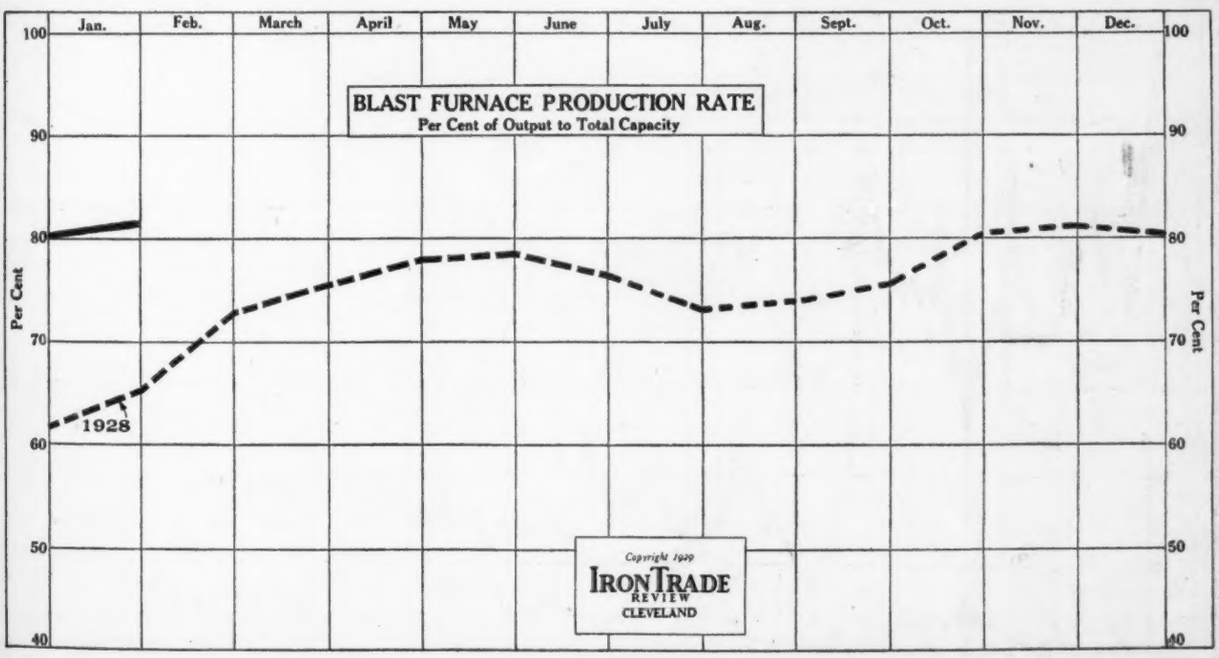


Pig Iron Production

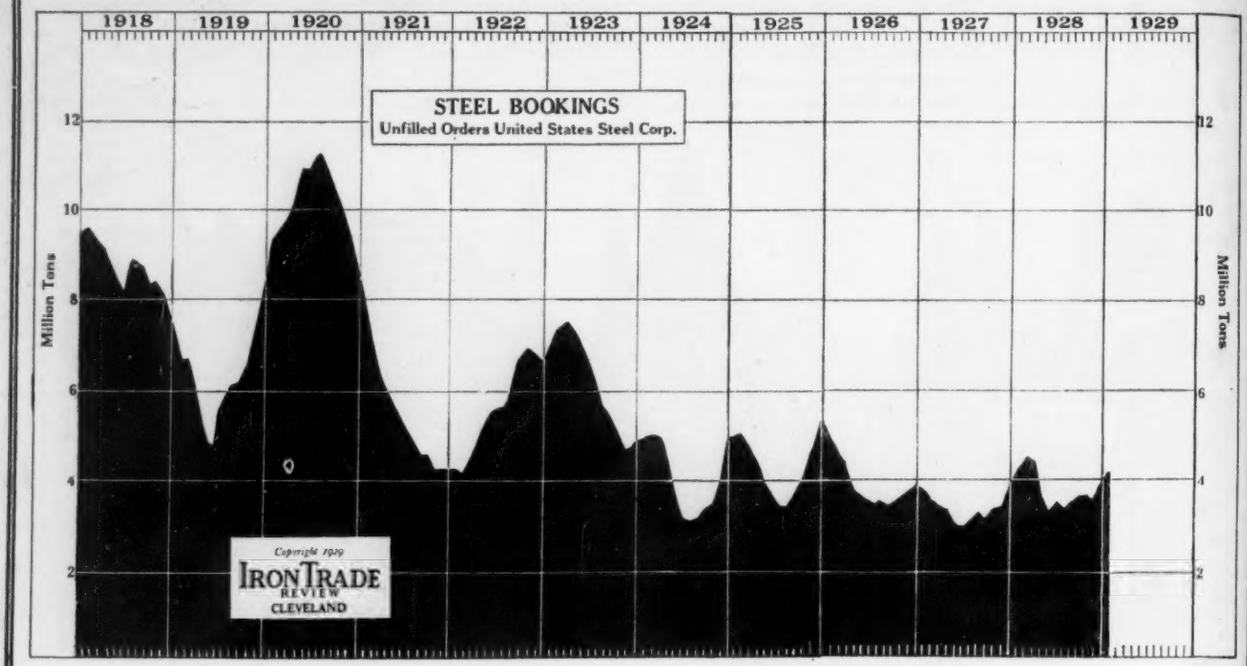
JANUARY production of pig iron reached a new high mark for that month with a daily average rate of 110,736 tons. The previous January peak of 108,781 tons was in 1925. In January, 1928, the daily average rate was 92,113 tons and two years ago it was 100,043 tons. The average for all of 1928 was 103,365 tons. The December rate was 108,702 tons and the highest daily average production pig iron in 1928 was 110,155 tons in November. Notwithstanding the large output during the month prices held steady.

Blast Furnace Production Rate

THE rate of operation of blast furnaces in January was 81.5 per cent. This compared with 80.2 per cent in December and with 65.4 per cent one year ago. The rate of operation of blast furnaces, which means the relation of production during the month to the aggregate capacity of furnaces in the country, was the highest in January of any recent month. The computation is based on a capacity of 49,605,722 tons as of Dec. 31, 1927. Indications point to an increase in this index in February.



The Business Trend

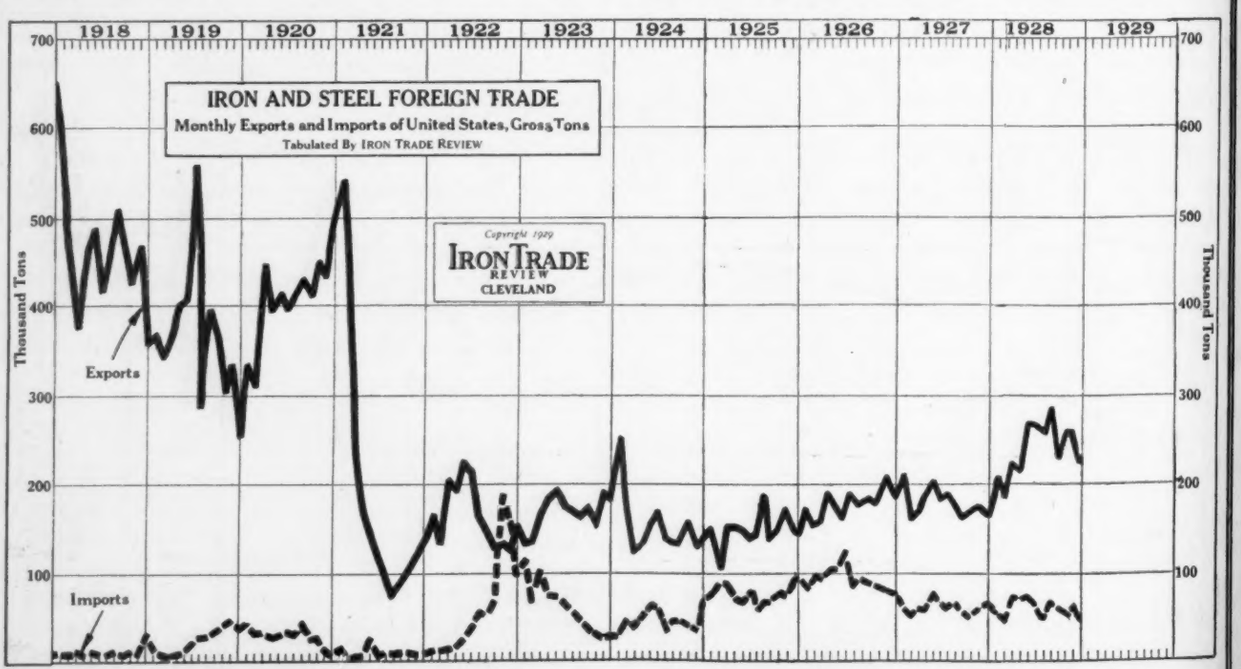


Unfilled Orders

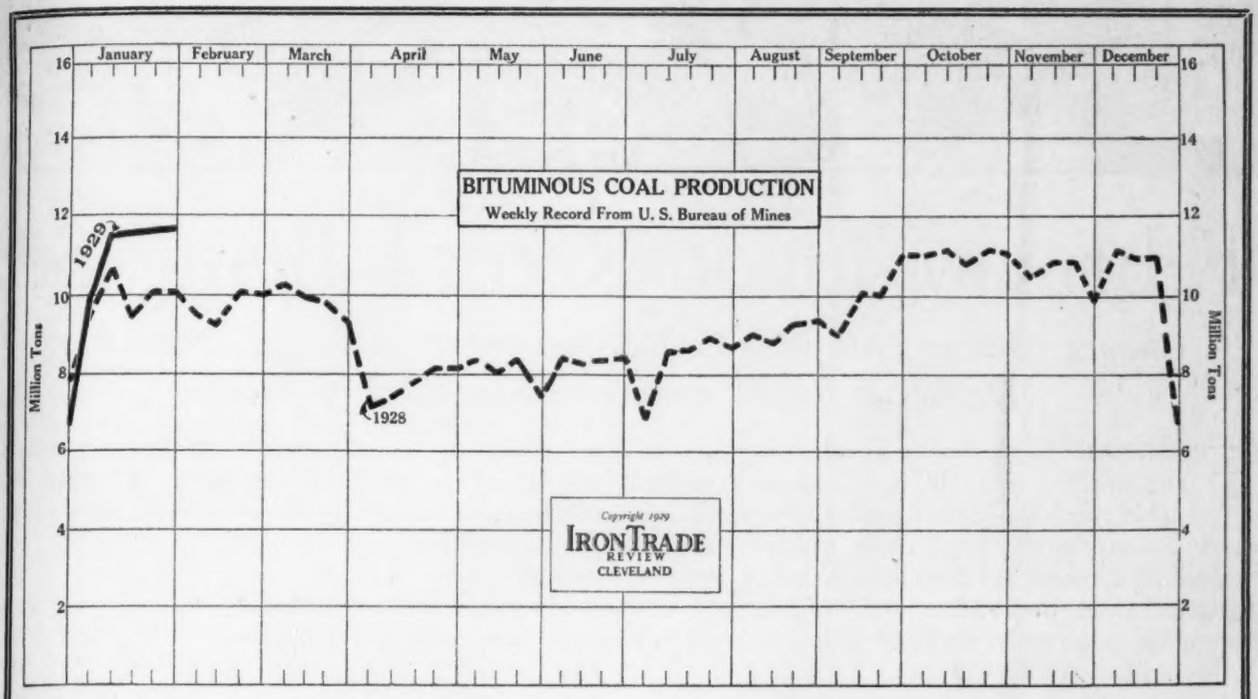
UNFILLED orders of the United States Steel Corp. showed another increase in January. Total volume of orders on the books at the end of the month stood at 4,109,487 tons compared with 3,976,712 tons one month before and 4,275,947 tons one year ago. The gain last month was 132,775 tons. This compared with an increase of 303,712 tons in December and with one of 303,073 tons in January, 1928. Orders are now at the highest level of any month since May, 1928.

Steel Foreign Trade

EXPORTS of iron and steel products from the United States in 1928 were the largest of any year since 1920. Export shipment for the year amounted to 2,862,997 tons compared with 2,180,969 tons in 1927. Imports also registered a gain with a total of 782,694 tons compared with 749,992 tons in 1927. Both exports and imports declined in December, with exports standing at 221,810 tons against 256,886 tons in November. Imports of 55,199 tons compared with 67,103 tons in November.



The Business Trend

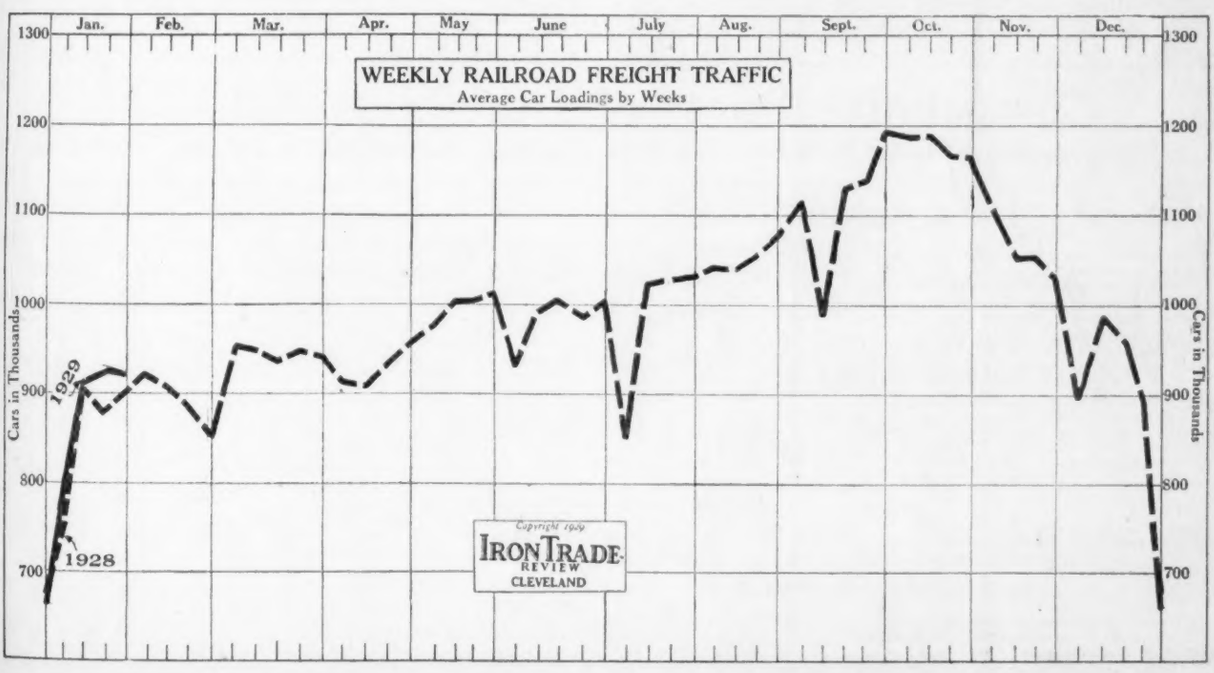


Bituminous Coal

TOTAL production of soft coal in January showed a sharp upward movement compared with preceding months. According to preliminary estimates by the bureau of mines of the department of commerce, the month's output was 51,485,000 tons compared with 43,380,000 tons in December and 44,208,000 tons in January, 1928. The production for the month was the highest of any month since March, 1927, which preceded the beginning of the strike in the union coal fields. Production for 1928 was 492,755,000 tons.

Weekly Freight Traffic

REVENUE freight carloadings for the week ended Jan. 26 totaled 926,188 cars. This was an increase of 23,524 cars compared with the corresponding week of 1928, but a decrease of 5692 cars from the total of 931,-880 cars in the preceding week. The high level of freight car traffic compared with that of one year ago reflects the more active rate of industrial activity of the present. The notably larger production and movement of coal than one year ago is an important factor.



February Ingot Record Being Set

Chance Alltime Peak May Be Reached—Sheet and Strip Prices Rise —Deliveries Recede Further—More Pig Iron Bought

FEBRUARY'S steelmaking rate indicates not only another monthly record but also brings within reach the highest daily ingot rate in history. January's daily ingot basis, which is now disclosed as a record for that month, was 4 per cent greater than December's and if February can maintain this rate of increase even last October's alltime ingot record will fall.

Lack of Semifinished Steel Hampers

Thus far in the month the trend of operations in all districts except Birmingham, where two steelworks stacks have been banked, has been upward. For the first time since the war a scarcity of semifinished steel at Pittsburgh, Youngstown and Chicago—particularly the latter two districts—is handicapping finishing mills. Delivery of steel generally has fallen farther behind this week despite record-breaking production.

Bar and plate mills at Chicago are scheduling desired sizes for rolling every 30 days. All plate mill capacity at Chicago is engaged for the first time since the armistice. In the Pittsburgh and Youngstown district important makers cannot promise cold strip short of six to eight weeks and hot strip four to five weeks. On highly finished sheets some makers are booked into April. In the East, bar and sheet deliveries are also receding.

This tight delivery situation so closely engages both producers and consumers of finished steel that bookings have been subordinated. This apparent indifference to future requirements has caused less distress within the industry than without. Specifications, not contracts, are the measure of steelworks activity, and since Jan. 1 specifications have exceeded shipments.

Tendency In Steel Prices Is Upward

Their improved position prompts steelmakers to attempt to put prices on a more remunerative basis. Hot strip, following the lead of cold rolled, has been advanced $2 per ton. Some independent sheetmakers are asking $2 per ton more for all grades save autobody for the remainder of the quarter. Other sheetmakers, most of whom are booked up for the quarter, have taken no action. There is further talk of a rise in steel bars, plates

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Feb. 13, 1929	Jan., 1929	Nov., 1928	Feb., 1928
PIG IRON				
Bessemer, del., Pittsburgh	$19.76	19.96	19.96	19.26
Basic, valley	17.50	17.50	17.70	17.00
Basic, eastern del., eastern Pa.	20.15	20.15	19.75	19.50
No. 2 foundry, del. Pittsburgh	19.26	19.36	19.56	19.01
No. 2 foundry, Chicago	20.00	20.00	20.00	18.50
*Southern No. 2, Birmingham	16.50	16.50	16.38	16.00
*Southern Ohio, No. 2 Ironton	18.50	18.50	18.25	19.00
**No. 2X, Virginia furnace	21.25	21.25	20.50	20.50
**No. 2X, eastern del. Phila.	22.26	22.26	21.51	20.91
Malleable valley	18.00	18.00	17.90	17.25
Malleable, Chicago	20.00	20.00	20.00	18.50
Lake Superior charcoal, del. Chicago	27.04	27.04	27.04	27.04
Gray forge, val., del. Pittsburgh	18.76	18.76	18.66	18.51
Ferromanganese, del. Pittsburgh	109.79	109.79	109.79	104.79
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.				
COKE				
Connellsville, furnace, ovens	2.85	2.75	2.85	2.65
Connellsville, foundry, ovens	3.75	3.75	3.75	3.75
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	34.00	34.00	33.60	34.00
Sheet bars, open-hearth, Pittsburgh	34.00	34.00	33.60	34.00
Billets, open-hearth, Pittsburgh	33.00	33.00	33.00	33.00
Wire rods, Pittsburgh	42.00	42.00	42.00	43.50

	Feb. 13, 1929	Jan., 1929	Nov., 1928	Feb., 1928
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.90	1.90	1.95	1.85
Steel bars, Chicago	2.00	2.00	2.00	1.95
Steel bars, Philadelphia	2.27	2.27	2.27	2.17
Iron bars, Chicago	2.00	2.00	2.00	1.95
Shapes, Pittsburgh	1.90	1.90	1.95	1.85
Shapes, Philadelphia	2.01	2.06	2.11	2.08
Shapes, Chicago	2.00	2.00	2.00	1.95
Tank plates, Pittsburgh	1.90	1.90	1.95	1.85
Tank plates, Philadelphia	2.10	2.10	2.15	2.10
Tank plates, Chicago	2.00	2.00	2.00	1.95
Sheets, black, No. 24, Pittsburgh	2.85	2.85	2.80	2.85
Sheets, blue anl., No. 10, Pittsburgh	2.10	2.10	2.05	2.10
Sheets, gal., No. 24, Pittsburgh	3.60	3.60	3.55	3.65
Sheets, black, No. 24, Chicago	3.00	3.00	3.00	3.05
Sheets, blue anl., No. 10, Chicago	2.25	2.25	2.15	2.25
Sheets, galvanized, No. 24, Chicago	3.75	3.75	3.65	3.90
Plain wire, Pittsburgh	2.50	2.50	2.40	2.45
Wire nails, Pittsburgh	2.65	2.65	2.55	2.60
Tin plate, per base box, Pittsburgh	5.35	5.35	5.30	5.25
SCRAP				
Heavy melting steel, Pittsburgh	18.75	19.00	17.35	15.05
Heavy melting steel, eastern Pa.	16.50	16.50	15.90	14.00
Heavy melting steel, Chicago	16.00	15.40	14.50	12.55
No. 1 wrought, eastern Pa.	16.25	15.50	15.50	15.25
No. 1 wrought, Chicago	15.75	14.75	14.25	12.40
Rails for rolling, Chicago	17.50	17.10	16.50	15.00

Current Prices for Rolled Steel Products

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED

STEEL PLATES

Pittsburgh, base	1.90c
Philadelphia, del.	2.10c to 2.20c
New York, del.	2.175c to 2.275c
Boston, del.	2.265c to 2.415c
Chicago, base	2.00c to 2.10c
Cleveland, delivered	2.09c
Lackawanna, N. Y., base	2.00c to 2.10c
Birmingham, base	2.05c to 2.15c
Coatesville, Pa., base	2.00c to 2.10c
Pacific Coast, c.i.f.	2.20c to 2.30c

STRUCTURAL SHAPES

Pittsburgh, base	1.90c
Philadelphia, del.	2.00c to 2.16c
New York, del.	2.145c to 2.195c
Boston, del.	2.265c to 2.415c
Chicago, base	2.00c to 2.10c
Cleveland, delivered	2.09c
Lackawanna, N. Y.	2.00c to 2.10c
Birmingham, base	2.05c to 2.15c
Bethlehem, Pa., base	2.00c to 2.10c
Pacific Coast, c.i.f.	2.35c

BARS

SOFT STEEL

Pittsburgh, base	1.90c to 1.95c
Chicago, base	2.00c to 2.10c
Birmingham, base	2.05c to 2.15c
Lackawana, N. Y., base	2.00c to 2.10c
Pacific Coast, c.i.f.	2.35c
Cleveland, base, local mills	1.90c
Cleveland, del., outside mills	1.95c
Philadelphia, del.	2.22c to 2.32c
New York, delivered	2.24c to 2.34c
Boston, delivered	2.265c to 2.415c
Pittsburgh, cold finishing	2.05c
Pittsburgh, forging quality	2.15c

RAIL STEEL

Chicago Heights	1.95c
Eastern mills	1.85c to 1.95c

IRON

Chicago, base	2.00c to 2.10c
New York, delivered	2.19c to 2.24c
Philadelphia, delivered	2.17c to 2.22c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pittsburgh, billet, cut lengths	2.25c
Stock lengths from mill	2.00c
Chicago, billet	2.35c to 2.60c
Chicago, rail steel	2.05c
Chicago, rail steel, road and bridge work	1.95c to 2.05c
Philadelphia, cut lengths	2.75c

COLD FINISHED STEEL

Cold finished steel bars, drawn or rolled, Pitts., chi., c.l.	2.20c
Shafting (turned, polished) Pittsburgh	2.20c
Shafting (turned, ground) mill (Depending on size, 1 3/16 to 7-inch)	2.55c to 3.00c
Cold finished steel bars, Cleve.	2.25c

TIN AND TERNE PLATE

Prices per 100-pound box Pittsburgh

*Tin plate, coke base	$5.35

Gary, Ind., base 10 cents higher.

Long ternes, primes, No. 24	4.00c to 4.10c

*Price subject to quantity differentials.

SHEETS

SHEET MILL BLACK

No. 24, Pittsburgh, base	2.85c
No. 24, Philadelphia, delivered	3.17c
No. 24, Gary, Indiana Harbor	2.95c
No. 24, Chicago, delivered	3.00c
No. 24, Birmingham, base	3.00c

TIN MILL BLACK

No. 28, Pittsburgh, base	3.00c
No. 28, Gary, base	3.10c

GALVANIZED

No. 24, Pittsburgh, base	3.60c
No. 24, Philadelphia, delivered	3.92c
No. 24, Gary, Indiana Harbor	3.70c
No. 24, Chicago, delivered	3.75c
No. 24, Birmingham, base	3.75c

BLUE ANNEALED

No. 10, Pittsburgh, base	2.10c
No. 24, Philadelphia, delivered	2.42c to 2.52c
No. 10, Gary, Indiana Harbor	2.20c
No. 10, Chicago, delivered	2.25c
No. 10, Birmingham, base	2.25c

AUTOMOBILE

No. 20, Pittsburgh, base	4.10c

FURNITURE

No. 24, Grade A, Pittsburgh	3.90c to 4.00c
No. 24, Grade B, Pittsburgh	3.75c to 3.85c

(*Turn to the following page*)

and shapes, and at least one interest may make an announcement in ten days. Semifinished steel prices are tighter, and coke is firmer.

Railroad equipment buying still provides the spectacular phase of market activity and insures a flow of steel specifications for some time to come. Already in February freight car awards exceed 10,000, which with the 13,196 bought in January bring the year's business past 23,000, compared with only 44,763 cars ordered in all 1928. In the past week the Illinois Central has distributed 2950 and the Pere Marquette 1400 cars. The Pennsylvania will buy 1000 bodies, while a New York Central inquiry is expected.

Bar Demand at Chicago Outruns 1928

Automotive steel requirements, while spotty, continue considerably heavier than a year ago. Some steel producers evidence a tendency to corral the entire requirements of large automotive interests, a process in which prices have suffered. Farm implement and tractor works, as a whole, are in the best February in their history. Typical of the widespread distribution of business at Chicago, orders for steel bars, which go into more metalworking plants than any other finished product, are running 15 per cent ahead of 1928. Pig iron sales and shipments in most districts show a slightly rising tendency. Automotive users are pressing for delivery. Second quarter selling at Chicago, St. Louis and Boston is heavier. With a daily rate of 166,274 gross tons, January easily set a new ingot production record. In only three months of 1928 was the output higher. Compared with the 160,777-ton rate of December, the increase is 4 per cent. Since the February record—reached in 1928—is only 161,812 tons, a recession from January would still leave February a record. But to pass the alltime peak of 172,144 tons of October, 1928, the increase of January need only be duplicated this month.

Two Stacks Blown In at Pittsburgh

This week, like last week, Steel corporation subsidiaries are operating at 88 per cent. Independents continue at 83 to 84 per cent, with the entire industry not far under 88 per cent. Chicago holds to a 92 per cent rate. The lighting of two steelworks blast furnace stacks at Pittsburgh will better the 85-87 per cent steelmaking rate there. In the Mahoning valley one open hearth furnace is out but finishing rates hold.

Though the British iron and steel trade is stronger a rise in the bank rate is a deterrent, according to the IRON TRADE REVIEW weekly market radio from London. More blast furnaces are being lighted. British pig iron output in January increased slightly over December, while ingot production rose sharply. German export business is larger. French and Belgian markets are active.

Composite Market Average

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets Tin Plate, Wire Nails and Black Pipe

This week (Feb. 13, 1929)	$36.25
Last week (Feb. 6, 1929)	36.25
One month ago (January, 1929)	36.24
Three months ago (November, 1928)	36.02
One year ago (February, 1928)	35.62
Ten years ago (February, 1919)	53.71
Fifteen years ago (February, 1914)	23.52

For the third consecutive week the IRON TRADE REVIEW composite of fourteen leading iron and steel products continues unchanged at $36.25, which is one point above the average recorded for last month.

Current Rolled Steel Prices

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED

SEE ALSO PRECEDING PAGE

HOOPS, BANDS, STRIPS

Hot strip, to 6-in., Pitts.	2.00c
Hot strip 6 1/8 to 24-in., Pitts.	1.90c
Hot rolled strip, 12 to 24-inch 16 gage and heavier, coils or cut length, 1.90c plate basis, or 2.10c blue annealed basis.	
Hot strip, bands 6 in. and under, Chicago	2.20c to 2.30c
Do, 6 1/8 to 24 in.	2.10c to 2.20c
Cold rolled strip, hard coils, 16 inches and under by 0.100-inch and heavier, base Pitts., Cleve. (3 tons and over)	2.95c
Worcester, Mass (3 tons and over)	3.10c to 3.20c

ALLOY STEEL

Hot Rolled
F.o.b. Mills

Alloy Quality Bar Base is 2.60c to 2.75c

S.A.E. Series Number	Alloy differential	Net, 100 lb. bars
2000	0.25	$3.00
2100	0.55	3.30
2300	1.50	4.25
2500	2.25	5.00
3100	0.55	3.30
3200	1.35	4.10
3300	3.80	6.55
3400	3.20	5.95
4100 0.15-0.25 Mo.	0.50	3.25
4100 0.25-0.40 Mo.	0.70	3.45
4600 0.20-0.30 Mo. 1.25-1.75 Ni.	1.05	3.80
5100 0.60-0.90 Cr.	0.35	3.10
5100 0.80-1.10 Cr.	0.45	3.20
5100 Chrome Spring	0.20	2.95
6100 Bars	1.20	3.95
6100 Spring Steel	0.95	3.70
Chrome Nickel Vanadium	1.50	4.25
Carbon Vanadium	0.95	3.70
9250 (flats)	0.25	3.00
9250 (rounds, squares)	0.50	3.25

TUBING

Boiler

Carload Discounts—F.o.b. Pittsburgh Mills

Steel 3 1/4 to 3 3/4-inch	56
Charcoal iron, 3 1/4 to 3 1/2-inch	18
Seamless hot rolled 3 1/4 to 3 1/2-inch	56

Lapwelded steel takes two supplementary 5 per cents for carload lots; charcoal, 10 per cent; seamless, 5 per cent.

Note: Discounts for additional sizes and less-than-carload shipments shown in Discounts and Extras table in back of book.

COLD DRAWN SEAMLESS

F.o.b. mill in desirable quantities

Random lengths, over 5 feet	55 per cent
Selected lengths, 1 to 18 feet	53 per cent

WIRE PRODUCTS

F.o.b. Pittsburgh, Cleveland, Ironton base
(Per pound)

	Dealer trade	Large jobbers
Bright plain wire, 6 to 9 gage	2.60c	2.50c
Annealed field wire	2.75c	2.65c
Galvanized wire	3.20c	3.10c
Barbed wire, galvanized	3.40c	3.30c
(Per 100-pound keg)		
Wire nails	$2.75	$2.65
Galvanized nails	4.75	4.65
Polished staples	3.20	3.10
Galvanized staples	3.45	3.35
Cement coated nails	2.75	2.65

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Pittsburgh-Cleveland-Ironton base on products made there; Duluth $2 higher, Worcester, Mass., and Fairfield, Ala., $3 higher.

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

Anderson, Ind., $1 higher, Chicago $2 higher, and Duluth and Birmingham $3 higher.

CUT NAILS, CHAIN, PILING

Cut nails c.l., f.o.b. mills	2.75c
Cut nails, l.c.l. f.o.b. mills	2.85c
Chain, 1-in., proof coil, Pitts.	6.00c
Sheet piling base, Pittsburgh	2.25c

CAST IRON WATER PIPE

Prices per net ton
Class B pipe

Six-inch and over, Birming'm	$37.00 to 38.00
Four-inch, Birmingham	41.00 to 42.00
Four-inch, Chicago	49.20 to 50.20
Six-inch to 24-inch, Chicago	45.20 to 46.20
Four-inch, New York	42.80 to 44.80
Six-inch and over, New York	39.80 to 41.80
Standard fittings, Bir. base	$100.00

Six to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $4 higher than Class B.

IRON AND STEEL PIPE

Base Discounts Pittsburgh and Lorain, O., to Jobbers in Carloads

	Black	Galv.
1 to 3-inch butt steel*	62	50*
1 to 1 1/2-inch butt iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less, Chicago, del., 2 1/2 points less.

*To large jobbers these discounts are increased on black by 1 point and a supplementary discount of 5 per cent on galvanized by 1 1/2 points with a supplementary 5 per cent.

RAILS, TRACK MATERIAL

Standard bessemer rails, mills	$43.00
Standard open-h'th rails, mill	$43.00
Relaying rails, St. Louis	$24.00 to 31.00
Relay rails, Pitts. 60 to 90 lb.	$22.00 to 27.00
Light rails, 25 to 45, mills	$36.00
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.80c
Spikes, small railroad, 7/16-inch and smaller, Pitts.	2.80c
Spikes, boat and barge, Pitts.	3.00c
Spikes, railroad, Chicago	2.80c
Track bolts, Pitts., steam roads	3.80c
Track bolts, Pitts., stand, jobbers	70 off list
Track bolts, Chicago	3.80c
Tie plates, Chicago, Pitts.	$43.00

BOLTS AND NUTS

Birmingham and Chicago

Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lots, apply to lists of April 1, 1927.

Small lots are 55 to 60 per cent off.

CARRIAGE BOLTS

All sizes, cut thread	60 to 70 off

Rolled thread 5/8 x 6 and smaller take 10 per cent lower list.

Eagle list	60 to 70 off

MACHINE BOLTS

All sizes, cut thread	60 to 70 off

Rolled thread 5/8 x 6 and smaller take 10 per cent lower list.

Lag screws	60 to 70 off
Plow bolts, Nos. 1-2-3-7 heads	60 to 70 off
Tap bolts	60 to 70 off
Blank bolts	60 to 70 off
Stud bolts without nuts	60 to 70 off

Stove bolts, 75, 20, 10 and 5 off in pkgs., 75, 20, 10 and 5 with 2 1/2 off in bulk.

Tire bolts	60-5 off

Nuts

Semifinished	60 to 70 off

HEXAGON CAP SCREWS

Milled	80-10-5 off
Upset 1 in. diam. and smaller	85 off

SQUARE HEAD SET SCREWS

Milled	80-5 off
Upset 1 in. diam. and smaller	80-10-5 off

RIVETS

Struc. c.l., Pitts.-Cleve.	2.90c to 3.10c
Structural, c.l., Chicago	3.00c to 3.20c
**7/16-inch and smaller, Pitts.	70 and 10 off
Chi., Cleve.	70 to 70 and 10 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

WASHERS

Wrought, c.l., Pitts. dist.	$6.50 to 6.75 off
Wrought, c.l., Chicago dist.	$6.70 to 6.90 off
Lock: to dealers	85-5 off
Lock: to consumers	85 off

Raw Materials and Semifinished Products

SEMIFINISHED MATERIAL

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$33.00
Pittsburgh, bessemer	33.00
Youngstown	33.00
Cleveland	34.00
Philadelphia	38.30
Chicago	35.00
Forging, Chicago	40.00
Forging, Pittsburgh	38.00
Forging, Philadelphia	43.30

SHEET BARS

Pittsburgh	$34.00
Youngstown	34.00
Cleveland	34.00
Chicago	35.00

SLABS

Pitts., Young., and Cleve.	$33.00

WIRE RODS

Pittsburgh, Cleveland	$42.00
Chicago	43.00

SKELP

All grades, Pittsburgh	1.85c to 1.90c

IRON ORE

LAKE SUPERIOR ORE

Per Gross Ton, Lower Lake Ports

Old range bessemer, 51 1/2 %	$4.55
Mesabi bessemer, 51 1/2 %	4.40
Old range nonbessemer 51 1/2 %	4.25
Mesabi nonbessemer, 51 1/2 %	4.25

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63 %	8.00
Copper free low phosphorus 58 to 65 per cent	nominal

FOREIGN ORE

Cents per unit, alongside docks, Atlantic ports

Foreign manganiferous ore, 45-55 % iron, 6-8 % manganese	10.50 to 11.00
North African low phosphorus	10.00 to 11.00
Swedish foundry or basic, 65 %	9.00 to 9.50
Spanish and North African basic, 50 to 60 per cent	nominal
Newfoundland foundry, 55 %	8.50

MANGANESE ORE

Prices do not include duty of 1 cent per pound of metallic manganese contained.

Brazilian	35 cents
Indian	35 to 36 cents
Caucasian, (53-55 per cent	36 to 38 cents

FLUORSPAR

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton	$18.00
Washed gravel, imported duty paid, east, tidewater, gross ton	$19.40 to 20.40

REFRACTORIES

FIRE CLAY BRICK

Per 1000 f.o.b. works

First Quality

Pennsylvania	$43.00 to 46.00
Ohio	43.00 to 46.00
Illinois	43.00 to 46.00
Kentucky	43.00 to 46.00
Missouri	43.00 to 46.00
Maryland	43.00 to 46.00
Georgia and Alabama	40.00 to 45.00

Second Quality

Pennsylvania	35.00 to 38.00
Ohio	35.00 to 38.00
Illinois	35.00 to 38.00
Kentucky	35.00 to 38.00
Missouri	35.00 to 38.00
Maryland	35.00 to 38.00
Georgia and Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham	50.00 to 51.00

MAGNESITE BRICK

Per Net Ton

9 x 4 1/2 x 2 1/2	65.00

MAGNESITE

Net Ton Chester, Pa., and Baltimore base

Dead-burned grain magnesite	40.00

CHROME BRICK

Net Ton Chester, Pa., and Baltimore base

9 x 4 1/2 x 2 1/2	45.00

Pig Iron

Shipments Continue Heavy—Market Firm in Middle West—Valley Furnaces Offer Stronger Competition in Indiana

STRONGER contrasts appear in the pig iron market. Quieter conditions are noted in some districts, while in others more activity is presented. Pittsburgh reports a dearth of buying there and in the valley districts. The market in the eastern states has lost much of its recent momentum. In western Ohio, northern Indiana, lower Michigan and Chicago districts the market continues to show vitality, and the weekly volume of sales is increasing slowly but steadily. Shipments in these districts, especially to automotive interests are unusually heavy, and leading producers report the movement is at a better rate than in January. Some valley furnaces in need of tonnage are reaching into Indiana, while nearby lake furnaces with large backlogs are not competing.

PITTSBURGH, Feb. 12.—The pig iron market is presenting an even tenor, with little new business to feature it. Producers report continued steady shipments, with gradual depletion of stocks of some grades. Furnace backlogs in certain instances are satisfactory, but in others are declining and fresh orders are needed to replace tonnage that is lacking. Absence of new general inquiries is not taken as an indication of a dull market, as contracts of some consumers extend past the first quarter, and others are placing small tonnages from time to time, instead of buying far ahead. Orders are being booked with usual sources of supply, without issuance of general inquiries. The inquiries of the Richmond Radiator Co., and the National Radiator Corp. for second quarter foundry iron are the only ones pending in the open market. Prices are steady.

Boston, Feb. 12.—Pig iron sales increased to 7000 tons in the past week. The Universal Winding Co., Providence, R. I., is understood to have bought 1200 tons of No. 2X and No. 1X from a New York furnace. Mystic Iron Works sold 1000 tons of low phosphorus to a Connecticut melter. The Rhode Island Malleable Co. is in the market for 500 to 800 tons of malleable. Prices are steady.

New York, Feb. 12.—Current pig iron business comprises numerous small and moderate size tonnages, with a fair total. Only a few inquiries are noted. Prices continue equivalent to $17.50 to $18, base, Buffalo, with occasional sales at less where special requirements are involved.

Buffalo, Feb. 12.—Second quarter pig iron inquiry is increasing in volume. Furnaces quote current prices for that delivery. A New York state melter is in the market for 2500 tons of foundry iron. Radiator and boiler manufacturers are taking more iron. The Toronto consumer who was in the market for upward of 5000 tons is understood to have placed a large portion of this with dominion furnaces. Operations and prices here are unchanged, with $18.50 reported as the district base on foundry and $19 on malleable. In the East 50 cents lower is available.

Philadelphia, Feb. 12.—Pig iron shipments continue heavy, but new business is quiet. The market has lost some of its recent momentum. Foundry iron continues $21, base, eastern Pennsylvania furnace. Indications are that at least two weeks will elapse before more basic iron is sold. American Radiator Co. has purchased 600 tons for its Gloucester, N. J., plant. It is understood the order was placed with the Mystic Iron Works for shipment by water.

Cleveland, Feb. 12.—Yard stocks of pig iron producers show steady decrease. Current shipments are above the January rate. Furnace companies with large order books are well satisfied with the prospects for continuance of heavy shipments. Demands in the Detroit manufacturing district are especially active. Some consumers are increasing the size of their contracts. Middle interests are inquiring here for prices on pig iron for shipment by vessel to the Chicago district. A Milwaukee manufacturer is reported in the market for 2000 tons of basic. A Cincinnati foundry wants 600 tons of foundry iron. Pig iron sales by all furnace interests with headquarters here totaled 28,000 tons in the past week, about 4000 tons more than in the week preceding. Weekly volume of sales has been increasing steadily since the first of the year. Most Cleveland melters are covered, but a few carloads were sold in the past week at the established price of $19, base, furnace, for local delivery. In outside competitive territory the price continues $18.50, base, furnace.

Cincinnati, Feb. 12.—Business in pig iron is quiet, buyers showing reluctance to cover second quarter needs. The outstanding inquiry is that of the Lunkenheimer Co., Cincinnati, for 1300 tons of northern foundry. A small Indiana melter is inquiring for 200 to 300 tons of malleable. The Marmon Motor Car Co., Indianapolis, has purchased about 2250 tons in the Chicago district. Reports are that this contract was closed at a price somewhat less than the regular schedule. Unwillingness of sellers here to shade indicates a continued firmness of prices. The Martins Ferry furnace of the Wheeling Steel Corp. is shipping malleable and foundry iron by water to Ohio river points.

St. Louis, Feb. 12.—Steady buying of pig iron continues, with increasing interest in second quarter requirements. Business at mills and foundries is brisk. Melters are taking new orders for their products on a basis of present pig iron prices, with which they are mainly satisfied. The melt has gained during the past two weeks, and there is anxiety to get in raw material. Shipments are holding up exceptionally well. A local malleable interest bought 1000 tons in the past week. The largest transaction in foundry iron was 2000 tons taken by a radiator manufacturer for its Illinois

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Pig Iron Prices

Per Gross Ton

Bessemer, valley furnace	$18.00 to 18.25
Bessemer, del. Pittsburgh	19.76 to 20.01
Basic, valley furnace	17.50
Basic, del. Pittsburgh	19.26
Basic, Buffalo furnace	17.50
Basic, del. eastern Pa.	20.15 to 20.76
Malleable, valley furnace	18.00
Malleable, del. Pittsburgh	19.76
Malleable, Cleve. furn. for local del.	19.00
Malleable, Chicago furnace	20.00
Malleable, Buffalo furnace	19.00
Malleable, del. eastern Pa.	21.76 to 22.26
Malleable, Granite City fur.	20.50
No. 1 foundry, Chicago furnace	20.50
No. 1X, eastern del., Phila.	20.00
No. 1X, Buffalo furnace	20.00
No. 2 foundry, del. Pittsburgh	19.26
No. 2 foundry, valley furnace	17.50
No. 2 plain, Buffalo furnace	18.50
No. 2 foundry, Chicago furnace	20.00
No. 2 foundry, Granite City	20.00
No. 2 foundry, Ironton furnace	18.50
No. 2 fdy. Cleve. furn. for local del.	19.00
No. 2 plain, del. Phila.	21.76
No. 2 plain, Virginia furnace	20.75
No. 2 plain, Buffalo, del. Boston	22.41 to 22.91
No. 2 plain, N. J., tidewater	20.78 to 21.28
No. 2 Alabama, Birmingham	16.50 to 17.00
No. 2 Alabama, del. Cincinnati	20.19 to 20.69
No. 2 Tenn., Birmingham base	16.50
No. 2 Tenn., del. Cincinnati	20.19
No. 2 Alabama, del. Chicago	22.51 to 23.01
No. 2 Alabama, del. Cleveland	22.76 to 23.26
No. 2 Alabama, del. St. Louis	21.42
No. 2X, east, N. J., tidewater	21.28 to 21.78
No. 2X, eastern, del. Phila.	22.26
No. 2X, foundry, Buffalo furnace	19.00
No. 2X, Buffalo, del. Boston	22.91 to 23.41
No. 2X, Virginia furnace	21.25
Gray forge, val., del. Pittsburgh	18.76 to 19.26
Low phos., standard, valley	27.00
Low phos., standard, Phila.	24.26 to 24.76
Low phos., copper bearing fur.	23.00 to 23.50
Charcoal, Superior, del., Chicago	27.04

CANADIAN PRICES

No. 2 foundry, del. Toronto	23.60
No. 2 foundry, del. Montreal	25.00 to 25.50
Malleable, del. Toronto	23.60
Malleable, del. Montreal	25.00 to 25.50
Basic, del. Montreal	24.00 to 24.50

Silvery iron, Jackson county, O., furnaces, in per cents: 5—$23 to $24; 7—$25 to $26; 8—$26 to $27; 9—$27 to $28; 10—$29 to $30; 11 $31 to $32; 12—$33 to $34; 13—$35 to $36.

Bessemer ferrosilicon, Jackson county, O., furnaces, in per cents: 10—$31 to $32, 11—$33 to $34; 12—$35 to $36; 13—$37 to $38; 15—$41.50 to $42.50; 16—$43 to $44.

The Market Section

Coke

Connellsville Market Moving Up —Scarcity of Foundry Fuel in Some Districts

CONTINUED heavy demands for coke for heating purposes features the market. Scarcity of foundry fuel is reported in some districts. In the Connellsville district furnace coke has been advancing in the past two weeks, $3 now being obtained for small, prompt tonnages. Output by merchant interests has been increased, although some steel interests have curtailed.

Pittsburgh, Feb. 12.—The beehive coke market is in a stronger position. In the face of buying by two steelworks a week ago, production in the Connellsville district declined during the week ended Feb. 2 to the second lowest weekly level this year, although this resulted entirely through restriction of furnaces' oven operations. The output by merchant interests was the largest so far this year. Unless assured of substantial demand a month or more ahead, operators are loath to light additional ovens. Another steel works is in the market for a spot tonnage of coke. Little, if any, material is available for such orders, and more sellers are asking $3 at which price some small lots have been placed. Contract shipments are active, and some producers have been forced to enter the market in an attempt to obtain coke to fill requests from old customers for small spot tonnages. Heating coke is in demand, and supplies are scarce. Foundry coke sales are steady, with prices unchanged.

Production of coke in the Connellsville region for the week ended Feb. 2 was 60,120 tons, compared with 63,850 tons the preceding week, according to the *Connellsville Courier*.

Boston, Feb. 12.—Demand for foundry coke is fairly active. Sales of domestic coke this quarter will reach record figures for this district.

New York, Feb. 12.—Good specifications continue to be made against foundry coke contracts. Beehive foundry coke continues $3.75 to $4.25 at Connellsville ovens, and $4.85 at Latrobe, Pa. By-product foundry coke continues $11, delivered at most New England consuming points, and $9 to $9.40, delivered at Newark, N. J. There is a brisk demand for beehive furnace coke for miscellaneous purposes; this fuel has risen about 25 cents, brokers now getting $3 to $3.25, Connellsville, from consumers here.

Chicago, Feb. 12.—By-product foundry coke shipments during January at South Chicago and at Milwaukee were a record for that month since the war. By-product foundry coke is $8, ovens, and $8.75 for local delivery.

Cincinnati, Feb. 12.—Continued shortage of domestic by-product coke in the Detroit area is a factor in keeping this market strong. By-product foundry also is finding a ready market at Detroit. All sales to Detroit, however, are on spot shipments, buyers fearing that a sudden break in cold weather may cause surplus. Automobile manufacturers are making heavy demands for foundry coke.

St. Louis, Feb. 12.—Foundries have been ordering out coke in good volume. Shipments during January were much higher than in the same month in 1928. The first week of this month was marked by a slight recession from the January average, but was equal to the corresponding period last year.

Birmingham, Ala., Feb. 12.—All by-product coke works in this district are in operation, although a few ovens are out of commission, and full speed is not sought at all plants.

Coke Prices

Prices per Net Ton

Beehive Ovens	
Connellsville furnace	$2.85 to 3.00
Connellsville foundry	3.75 to 4.85
New River foundry	6.00 to 6.50
Wise county foundry	4.25 to 5.25
Wise county furnace	3.50 to 4.25
By-Product Foundry	
Newark, N. J., del.	9.00 to 9.40
Chicago, ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham	5.00
Indianapolis, del.	8.25
Ashland, Ky.	7.00
Portsmouth, O.	7.00
Detroit, ovens	8.50
Buffalo, ovens	8.75

Ferroalloys

Spiegeleisen Supply Easier—Spot Sales Increase—General Market Firm

New York, Feb. 12.—Spot demand for spiegeleisen has improved and numerous carload sales are noted at $34, furnace, for 19 to 21 per cent. As another furnace has been blown in, the domestic supply of spiegeleisen is easier. Contracts continue to be renewed as they expire, most consumers being under contract for the remainder of first half. On large tonnages differentials under $34 are allowed. Some English spiegeleisen continues to be sold at $34 to $35, duty paid, tidewater, for 19 to 21 per cent. Shipments of ferromanganese continue heavy. Few sales are reported. Special ferroalloys are unchanged, with nearly all business on specifications against contracts. Tungsten ore now looks firmer, with wolframite $11.75 to $12 a short ton unit.

Pittsburgh, Feb. 12.—Ferroalloy shipments are increasing with higher operations in the steel industry. Demand for ferrosilicon, ferrochrome and other special ferroalloys is well maintained. Spiegeleisen continues $34 on spot orders of 19 to 21 per cent.

Pig Iron

(*Concluded from Page* 483)

plants. An Alton, Ill., jobbing foundry purchased 500 tons. Prices are firm.

Birmingham, Ala., Feb. 12.—Continued slowness is noted in pig iron buying. Delivery of iron is a little improved, one company still reporting more iron shipped than produced. Two of the larger furnaces recently on basic iron are banked. Republic Iron & Steel Co. has blown in a second furnace at Thomas on foundry iron. Foundry iron continues $16.50, base, Birmingham.

Toronto, Ont., Feb. 12.—While demand for foundry iron continues the outstanding feature in the Canadian pig iron market, sales of malleable iron were larger during the week. Improvement is noted in shipments. While Toronto prices are unchanged, a spread of 50 cents per ton features Montreal prices. Malleable iron at Montreal is $25 to $25.50; No. 2 foundry, $25 to $25.50 and basic, $24 to $24.50.

Chicago, Feb. 12.—Considerable pig iron tonnage for second quarter is being closed quietly. Several large orders now are being negotiated. Sellers expect to benefit from heavy car equipment buying. Weakness in the valley market is reflected in Indiana, but $20, Chicago, is firm for the base grades. Stronger conditions in the Buffalo market indicate lighter boat shipments to the Chicago and Milwaukee district next season. Slight weakness in scrap is not affecting pig iron prices. An order for several thousand tons of foundry iron is pending. One thousand tons of basic has been closed.

Ferroalloy Prices

(In dollars, except ferrochrome)

Ferromanganese, 78 to 82 per cent tidewater duty paid	$105.00
Ferromanganese, del. Pittsburgh	109.79
Spiegeleisen, 19 to 21 per cent domestic furnace, spot†	34.00
*Ferrosilicon, 50 per cent, freight allowed, carloads	83.50
*Do., less carload	88.50
Do., 75 per cent	130.00 to 150.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb. con., del.	11.00
Do., for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.04 to 1.10
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload, producer's plant, net ton	160.00
Do, one ton to carload	170.00
Ferrophosphorus, per ton, carload, 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23-25% f.o.b. Anniston, Ala. (24 per cent)	122.50

†Quantity diff. apply on 100 tons and over.
*These prices contract, spot $5 higher.

Scrap

Slightly Lower Levels Prevail but Market Avoids Break—Adjustment Seems Well Made

EFFECTS of the break at Detroit a week ago have been minimized and heavy consumption of iron and steel scrap seems to have caught up with the enlarged production. Slightly easier prices prevail in most centers on some grades but the market is strong in the main.

Chicago, Feb. 12.—The slight easiness in iron and steel scrap is seen chiefly in cast borings and hydraulic compressed sheets. Heavy melting steel is nominal at $16 to $16.50, while rail scrap is scarce and at a premium. With scrap yards ice-bound and shipments down, scrap is coming out slowly. Railroad offerings are slightly below normal. The fact that borings, normally going to the Northwest, St. Louis, Michigan and Ohio river points and elsewhere, have been drawn into the Chicago market by the recent high prices more rapidly than dealers cleared their books of orders, has made supplies ample, especially with the three main consumers in the district supplied for the present. Hydraulic compressed sheets have been attracted into this market by high prices from various points, including the Birmingham, Ala., district.

Boston, Feb. 12.—Limited buying of scrap materials for the Pittsburgh district has dropped off, resulting in a quiet situation. While a fairly firm price range continues, this is being maintained on limited business.

New York, Feb. 12.—An easier tendency in scrap continues. Follow-

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except Detroit where dealers' buying prices are shown

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	$11.50 to 12.50
Boston, dealers	12.25 to 12.75
Boston, No. 2	10.00 to 10.50
Buffalo, No. 1	17.00 to 18.00
Buffalo, No. 2	14.25 to 14.75
Chicago	16.00 to 16.50
Cincinnati, deal.	13.75 to 14.25
Cleveland, No. 1	15.50 to 16.00
Cleveland, No. 2	15.00 to 15.50
Detroit, No. 1	14.25 to 14.50
Detroit, No. 2	12.00 to 12.25
East Pa., del. mill	16.50
Eastern Pa. No. 2	15.00
N. Y., deal., R. R.	12.50 to 13.00
N. Y., deal., yd.	8.75 to 10.00
Pittsburgh, No. 1	18.50 to 19.50
St. Louis, No. 1	14.50 to 15.00
St. Louis, No. 2	13.75 to 14.00
Valleys, No. 1	17.50 to 18.50

COMPRESSED SHEETS

Buffalo	15.75 to 16.25
Chicago	14.50 to 15.00
Cleveland	15.00 to 15.50
Detroit	14.25
E. Pa. new mat.	15.00
Pittsburgh	18.50 to 19.00
Valleys	17.50 to 18.00

BUNDLED SHEETS

Buffalo	12.50 to 13.00
Cincinnati, deal.	11.00 to 11.50
Cleveland	13.00 to 13.50
Eastern Pa.	11.00 to 11.50
Pittsburgh	17.00 to 17.50
St. Louis	10.00 to 10.50

SHEET CLIPPINGS LOOSE

Chicago	8.50 to 9.00
Cincinnati	10.25 to 10.75
Detroit	9.50 to 10.00
St. Louis	10.00 to 10.50

STEEL RAILS, SHORT

Birmingham	12.00 to 13.00
Boston	11.75 to 12.75
Buffalo	18.50 to 19.50
Chicago, (3 feet)	19.50 to 20.00
Chicago, 2 ft. and under	20.25 to 20.75
Cincinnati, deal.	19.00 to 19.50
Detroit	17.00 to 17.50
Pittsburgh	20.00 to 20.50
St. Louis	17.00 to 17.50

STOVE PLATE

Birmingham	13.00 to 13.50
Boston consumers	11.00 to 11.50
Buffalo	14.50 to 14.75
Chicago, net	12.75 to 13.25
Cinn., deal., net	10.00 to 10.50
Detroit, net	9.50 to 10.00
Eastern Pa.	13.00 to 13.50
N. Y. deal., mill	8.75 to 9.00
Pittsburgh	12.00 to 12.50
St. Louis	13.50 to 14.00

ANGLE BARS—STEEL

Chicago	17.00 to 17.50
St. Louis	15.00 to 15.50

COUPLERS, SPRINGS

Buffalo	18.50 to 19.00
Chicago	17.00 to 17.50
Eastern Pa.	19.00 to 19.50
Pittsburgh	20.00 to 20.50
St. Louis	16.00 to 16.50

LOW PHOSPHORUS

Buffalo, billet and bloom crops	19.00 to 20.00
Eastern Pa.	19.00 to 20.50
Pitts. billet and bloom crops	22.50 to 23.00
Cleve. billet and bloom crops	17.50 to 18.00

FROGS, SWITCHES, GUARDS

Chicago	16.75 to 17.25
St. Louis	15.75 to 16.25

SHOVELING STEEL

Chicago	16.00 to 16.50
Cleveland	12.00 to 12.50
Detroit	10.75 to 11.00
Pittsburgh	18.50 to 19.00
St. Louis	13.75 to 14.25

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	9.50 to 10.50
Boston, dealers	11.50 to 12.00
Buffalo, No. 1	13.50 to 14.00
Buffalo, No. 2	16.00 to 17.00
Chicago, No. 1	15.75 to 16.25
Chicago, No. 2	16.50 to 17.00
Cinn., No. 2	13.75 to 14.25
Eastern Pa.	16.00 to 16.50
N. Y., No. 1 deal.	12.00 to 12.50
Pittsburgh, No. 1	15.00 to 15.50
Pittsburgh, No. 2	18.50 to 19.00
St. Louis, No. 1	14.00 to 14.50
St. Louis, No. 2	14.50 to 15.00

SPECIFICATION PIPE

Boston	11.00 to 11.50
Eastern Pa.	16.00 to 16.50
New York, deal.	11.25 to 11.75

BUSHELING

Buffalo, No. 1	15.50 to 16.50
Chicago, No. 1	14.00 to 14.50
Cinn., No. 1 deal.	11.00 to 11.50
Cinn. No. 2	8.00
Cleveland, No. 1	13.00 to 13.50
Cleveland, No. 2	11.50 to 12.00
Detroit, No. 1	12.00 to 12.50
St. Louis, No. 1	10.00 to 10.50

MACHINE SHOP TURNINGS

Birmingham	9.00 to 9.50
Boston	6.75 to 7.00
Buffalo	8.75 to 9.25
Chicago	10.00 to 10.50
Cincinnati, deal.	9.75 to 10.00
Cleveland	10.50 to 11.00
Detroit	7.50 to 7.75
Eastern Pa.	12.00 to 12.50
New York, deal.	8.00
Pittsburgh	11.50 to 12.00
St. Louis	8.00 to 8.50
Valleys	12.00 to 12.50

MIXED BORINGS, TURNINGS

For blast furnace use

Boston, dealers	6.00 to 6.50
Buffalo	11.75 to 12.25
Cincinnati, deal.	10.00 to 10.50
Cleveland	11.50 to 12.00
Detroit	9.00 to 9.50
Eastern Pa.	11.00
New York, deal.	6.25 to 7.25
Pittsburgh	12.50 to 13.00

CAST IRON BORINGS

Birmingham, chem.	13.00 to 13.50
Birmingham, plain	9.00 to 9.50
Boston, chem.	10.25 to 10.50
Boston, dealers	6.50 to 7.00
Buffalo	11.75 to 12.25
Chicago	12.50 to 13.00
Cincinnati, deal.	10.00 to 10.50
Cleveland	11.50 to 12.00
Detroit	9.00 to 9.50
Eastern Pa.	11.50
Eastern Pa., chem.	14.50 to 15.00
New York, deal.	7.00 to 7.50
Pittsburgh	12.50 to 13.00
St. Louis	10.50 to 11.00
Valleys	12.50 to 13.00

PIPE AND FLUES

Cincinnati, deal.	9.00 to 9.50

RAILROAD GRATE BARS

Buffalo	13.00 to 14.00
Chicago, net	12.50 to 13.00
Cincinnati	10.00 to 10.50
Eastern Pa.	13.00 to 13.50
New York, deal.	9.25 to 9.75
St. Louis	12.50 to 13.00

FORGE FLASHINGS

Boston, dealers	10.00 to 10.50
Buffalo	13.75 to 14.25
Chicago	10.50 to 11.00
Cleve., over 10 in.	13.00 to 13.50
Detroit	12.50 to 12.75
Pittsburgh (light)	15.50 to 16.00

FORGE SCRAP

Boston, dealers	8.75 to 9.50
Chicago	18.50 to 19.00
Eastern Pa.	12.00 to 13.00

ARCH BARS AND TRANSOMS

Chicago, net	21.50 to 22.00
St. Louis	22.25 to 22.75

Iron, Steel Works Scrap

AXLE TURNINGS

Boston, deal	6.75 to 7.00
Buffalo	14.00 to 14.50
Chicago	13.00 to 13.50
Cleveland	12.50 to 13.00
Eastern Pa.	15.00
Pittsburgh	16.00 to 16.50
St. Louis	11.75 to 12.25

STEEL CAR AXLES

Birmingham	16.00 to 17.00
Boston, ship point	17.00 to 17.50
Buffalo	19.00 to 20.00
Chicago	18.00 to 18.50
Eastern Pa.	23.50
Pittsburgh	21.50 to 22.00
St. Louis	20.50 to 21.00

SHAFTING

Boston, ship point	14.00 to 14.50
Chicago	17.35 to 17.90
Eastern Pa.	19.00 to 20.00
New York, deal.	15.00 to 15.50
St. Louis	18.50 to 19.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	12.00 to 13.00
Boston, iron	14.00 to 14.50
Buffalo, iron	14.00 to 14.50
Buffalo, steel	18.00 to 19.00
Chicago, iron	14.50 to 15.00
Chi., rolled steel	19.25 to 19.75
Cincinnati	13.00 to 13.50
Eastern Pa., cast	17.00
Eastern Pa., rolled	19.00
N. Y., iron, deal.	12.50 to 13.00
Pittsburgh, iron	16.00 to 16.50
Pittsburgh, steel	20.00 to 20.50
St. Louis, iron	15.00 to 15.50
St. Louis, steel	18.00 to 18.50

No. 1 CAST SCRAP

Birmingham, cup.	14.50 to 15.50
Buffalo	16.00 to 16.50
Boston, textile	13.50 to 14.50
Chicago, mach.	17.90 to 18.50
Chicago, railroad	17.90 to 18.50
Chicago, agri.	16.25 to 16.80
Cincinnati, mach. cupolas, gross	19.50 to 20.00
Cleveland, cupola	16.50 to 17.00
Detroit, net	13.00 to 13.50
East. Pa., cupola	16.50 to 17.00
N. Y., cup., deal.	13.00 to 13.50
N. Y., del. local foundries	17.00 to 17.50
Pittsburgh, cupola	17.00 to 17.50
San Fran., del.	13.50 to 14.00
Seattle	16.00 to 16.25
St. L. No. 1 mach.	16.00 to 16.50
St. Louis, No. 1	15.00 to 15.50
Valleys	16.50 to 17.00

HEAVY CAST

Boston	10.50 to 11.00
Buffalo, breakable	13.00 to 13.50
Cleve., breakable	12.50 to 12.75
Detroit, auto., net	18.00 to 18.50
Detroit, breakable	10.00 to 10.50
Eastern Pa.	16.50
New York, deal.	12.00 to 12.50
Pittsburgh	13.50 to 14.00

MALLEABLE

Boston, railroad	16.50 to 17.00
Buffalo	17.00 to 17.50
Chicago, agri.	15.50 to 16.00
Chicago, railroad	19.50 to 20.00
Cinn., R. R., deal.	15.25 to 15.75
Cinn., agri., deal.	14.25 to 14.75
Cleveland, rail	16.00 to 16.50
Detroit, auto.	14.00 to 14.50
St. Louis, rail	16.50 to 17.00

Miscellaneous Scrap

RAILS FOR ROLLING

5 feet and over

Birmingham	13.00 to 14.00
Boston, dealers	12.00 to 12.50
Rails scrap, Boston	12.00 to 12.50
Skeleton, Boston	9.50 to 10.00
Buffalo	15.75 to 16.25
Chicago	17.50 to 18.00
Eastern Pa.	18.00 to 18.50
New York	14.00 to 14.50
Pittsburgh district	18.50 to 19.00
St. Louis	16.25 to 16.75

LOCOMOTIVE TIRES

Chicago, cut	19.00 to 19.50
St. Louis, No. 1	15.00 to 15.50

LOW PHOS. PUNCHINGS

Chicago	18.00 to 18.50
Pittsburgh	20.00 to 20.50

ing a reduction at Florence, N. J., dealers here have marked down the top price on heavy breakable cast to $12.50, New York, with a half dollar lower for other points. Dealers are now offering $8.75 to $10, New York, for yard steel for eastern consumption, a reduction of 75 cents on the inside figure.

Philadelphia, Feb. 12.—Considerable heavy melting steel has been sold at $16.50, delivered in this district and good sales of other grades have been reported. While this business in heavy melting steel is 50 cents under the recent price, other grades have moved up somewhat.

Buffalo, Feb. 12.—Tonnage sales of No. 1 heavy melting steel, long pending here, are expected to be completed this week. No offer has been made above $18 for best material and some purchasers think they may be able to buy for slightly less. The immediate demand for No. 2 heavy melting steel has been satisfied.

Pittsburgh, Feb. 12.—Iron and steel scrap consumers and dealers continue to mark time and changes in quotations are few. The February scrap list of the Baltimore & Ohio railroad is understood to have gone to a local mill at slightly over $19 for heavy melting steel and that on the Pennsylvania list to a nearby mill at close to $19.50. Dealers are attempting to cover on orders and although steel scrap still is scarce, generally they are not offering over $18.50 for heavy melting. Heavy cast shows a marked drop and now is quoted $13.50 to $14. Blast furnace material continues around $12.50 to $13.

Detroit, Feb. 12.—Iron and steel scrap remains steady, except that turnings and borings are slightly weaker. Present prices seem pegged for the present and no marked change is expected. Consumption of scrap seems to be taking up the excess production.

Cincinnati, Feb. 12.—This market is generally quiet, dealers displaying reluctance to buy on the decline, awaiting announcement of Pennsylvania awards, expected this week, as a price barometer. This list consisted of 55,000 tons.

St. Louis, Feb. 12.—Iron and steel scrap prices continue to rise. Further fractional gains were scored, mainly in steel. The entire list is strong, malleable showing especial firmness.

The rise is due chiefly to scarcity. Yard stocks are of moderate and considerably under the average at this period for five years.

Birmingham, Ala., Feb. 12.—Demand for scrap is slow and quotations weak, though no changes have been made in prices. Melters are not accepting shipments as steadily as they might. Heavy melting steel holds at $12.50 on the best quality, but buying is light.

Cleveland, Feb. 12.—Mills continue to take shipments upon orders, some of which are many weeks old. They are not, however, placing orders. Blast furnace scrap is down 25 cents per ton; turnings are weaker. Heavy melting steel still holds at $15.50 to $16. In the Mahoning valley, however, as low as $17.50 has appeared both on No. 1 heavy melting steel and on hydraulic compressed sheets.

Toronto, Ont., Feb. 12.—Despite the fact that the demand for iron and steel scrap in Toronto and Montreal markets is brisk and showing steady improvement, with dealers experiencing more difficulty in procuring supplies, prices remain unchanged. Sales of steel scrap were more numerous in both markets, but iron scrap is in strongest demand locally.

Semifinished Steel

Steel Scarcity Retards Finishing Mill Operations—Prices Are Firmer

SEMIFINISHED STEEL PRICES, PAGE 482

Pittsburgh, Feb. 12.—Semifinished steel is in a strong market and shortage of this material, apparent for several weeks, continues acute. A number of producers took contracts for the first quarter to supply semifinished steel and are finding their supply of material to accommodate their own finishing mills is small. Some mills have been forced to restrict their finishing operations for this reason. Although the market appears in a favorable position for an advance, nothing further than intimations have been heard. Sheet bars continue $34, with 4 x 4-inch rerolling billets and slabs $33. Wire rods are $42.

Philadelphia, Feb. 12.—Several small sales of billets are noted at $33, base, Pittsburgh, for rerollers, plus $5 for forging quality.

Cleveland, Feb. 12.—Demand for sheet bars, billets and slabs continues strong, and the leading merchant producer here is operating steadily at 100 per cent. Scarcity of sheet bars in some districts is reflected in more inquiries, but requirements of regular customers have been increased and there is little available for other sales. Prices are steady.

Youngstown, O., Feb. 12.—Mills here producing billets, slabs and sheet bars are confining their attention to shipments on contracts and to keeping their own mills supplied. Some are buying semifinished material from outside mills. Shortage of sheet bars is especially acute. Sheet bars, it is intimated, may be advanced $1 a ton before the end of this quarter. Today's quotation on sheet bars is $34 and on billets and slabs $33, Pittsburgh and Youngstown. Wire rods are firm at $42, Pittsburgh and Cleveland.

Canadian Scrap

Dealers' Buying Prices

MONTREAL
Per Gross Tons

Iron axles	$22.00
Steel axles	20.00
Car wheels	16.00
Stove plate	13.00
Wrought pipe	6.00
Turnings	6.50
Heavy melting steel	8.00

TORONTO

Steel axles	14.00
Iron axles	16.00
Heavy melting steel	9.50
Turnings	7.00
No. 1 mach. cast (net)	15.00
Malleable (net)	13.00

Unfilled Steel Tonnage Increases Again

Unfilled bookings of the United States Steel Corp. as of Jan. 31 amounted to 4,109,487 tons, an increase of 132,775 tons, or 3.34 per cent. This is the second successive increase and brings the total to the highest point since March 31, 1928, when 4,335,206 tons was reported. Further comparisons follow:

Date	Total	Change, tonnage	Change, per cent	
Jan. 31, 1929	4,109,487	132,775+	3.34	+
Dec. 31, 1928	3,976,712	303,712+	8.25	+
Nov. 30, 1928	3,673,000	78,030—	2.80	—
Oct. 31, 1928	3,751,030	52,662+	1.42	+
Sept. 30, 1928	3,698,368	74,325+	2.05	+
Aug. 31, 1928	3,629,042	53,116+	1.40	+
July 31, 1928	3,570,927	66,082—	1.81	+
June 30, 1928	3,637,009	220,187+	6.45	+
May 31, 1928	3,416,822	455,311—11.70		—
Apr. 30, 1928	3,872,133	463,073—10.70		—
Mar. 31, 1928	4,335,206	62,983—	1.43	—
Feb. 29, 1928	4,398,189	122,242+	2.80	+
Jan. 31, 1928	4,275,947	303,073+	7.62	+
Dec. 31, 1927	3,972,874	518,430+15.00		+
Nov. 30, 1927	3,454,444	113,404+	3.39	+
Oct. 31, 1927	3,341,040	192,921+	6.10	+
Sept. 30, 1927	3,148,113	47,924—	1.49	—
Aug. 31, 1927	3,196,037	54,023+	1.70	+
July 31, 1927	3,142,014	88,768+	2.80	+
June 30, 1927	3,053,246	2,305+	0.075	+
May 31, 1927	3,050,941	405,191—11.70		—
Apr. 30, 1927	3,456,132	97,008—	2.72	—
Mar. 31, 1927	3,553,140	43,979—	1.22	—
Feb. 28, 1927	3,597,119	203,058—	5.34	—
Jan. 31, 1927	3,800,177	160,792—	4.50	—
Dec. 31, 1926	3,960,969	153,522+	4.10	+
Nov. 30, 1926	3,807,447	123,786+	3.36	+

Two Steel Stacks Put On at Pittsburgh

Pittsburgh, Feb. 12.—Steel production rates are steady and generally unchanged in this district. Ingot output holds to slightly better than 85 per cent. Jones & Laughlin Steel Corp. has placed its No. 4 furnace at its Aliquippa works in blast. This stack was down for relining. Carnegie Steel Co. has started another furnace at its Farrell, Pa., works. Sheet production holds at around 95 per cent, with tin plate output near 90 per cent. Strip mills are at capacity. Pipe mill operations average 60 per cent, although seamless tube production is on a 70 to 90 per cent basis.

Chicago Steel Rate Holds at 92 Per Cent

Chicago, Feb. 12.—Steelworks operations in the Chicago district are unchanged at about 92 per cent of rated ingot capacity. Twenty-seven of the 36 steelworks furnaces in the district are active, including 18 of the Illinois Steel Co.'s 27 stacks, all four of Inland Steel Co., the three active stacks of Wisconsin Steel Co., and two of Youngstown Sheet & Tube Co. Plate and bar mills continue at capacity operations. All plate mills in the district are going in full for the first time since the war. Sheet mill operations in the Chicago district are above 80 per cent.

Bars

Mills at Capacity as Consumers Take Heavy Tonnage—Prices Hold on 1.90c, Pittsburgh, Basis

DELIVERIES have come to be the most important factor in the soft steel bar market. Mills find two to six weeks necessary in some instances to supply consumers. Price is a secondary consideration. Bar mills are operating as full as the supply of semifinished steel will allow. All classes of consumers are taking heavy tonnages for their purposes.

BAR PRICES, PAGE 481

Chicago, Feb. 12.—Deliveries are giving both sellers and buyers of finished steel more concern, particularly in bars and plates. Producers are adapting rolling schedules to 30-day cycles whenever possible, adding to and deducting from these 30-day schedules to accommodate consumer needs. Production could be crowded to a greater extent if raw and semifinished steel were available at all times. Both sales and specifications in bars and other finished products were ahead of the weekly average in 1928 about 15 per cent, and were in line with the weekly average since the beginning of this year. Mill orders for bars are ahead of shipments. Bar mill operations continue at capacity, with automotive and parts makers, implement works and cold drawn and finished consumers taking steady tonnages. All western tractor builders are enlarging capacities and have even heavier schedules than last year. Some estimates are that bar and general finished steel output and shipments will set a record this year for first quarter.

Soft steel bars are quoted 2.00c to 2.10c, Chicago, with only spot miscellaneous tonnage moving at 2.10c.

Philadelphia, Feb. 12.—Steel bar deliveries have moved forward on large demand and some mills now cannot give better than three to four weeks delivery. Prices are unchanged at 1.90c to 2.00c, Pittsburgh, with differentials.

New York, Feb. 12.—Steel bar demand continues heavy with numerous requests for prompt shipment. Prices continue firm at 1.90c to 2.00c, base, Pittsburgh, equivalent to 2.24c to 2.34c, delivered New York.

Pittsburgh, Feb. 12.—Delivery of hot-rolled merchant bars gradually is being extended and although buyers in some cases are able to obtain shipment within two weeks, some sizes extend four to six weeks. The latter is the exception. Operations continue heavy although restricted in certain instances by scarcity of semifinished material. Demand still is well diversified and practically all large consumers are sharing in current purchases. Automotive and cold drawn industries are specifying steadily. Mills are able to obtain 1.95c, Pittsburgh, in certain cases where a number of sizes are included in one order, but most buyers are able to fill their requirements at 1.90c.

Cleveland, Feb. 12.—Specifications for merchant steel bars are uninterrupted and most consumers are taking more this month than in January. For some Youngstown, O., mills February so far has been a better month than January. Deliveries gradually are becoming extended, most dates being three or four weeks after receipt of orders despite practically full operations. Outside mills ask 1.95c, delivered Cleveland, and local mills 1.90c, base, Cleveland.

Agree on Fair Value for Used Equipment

Washington, Feb. 12.—Manufacturers of woodworking machinery, who met at Chicago last December with a representative of the federal trade commission in a trade practice conference, have agreed that "no price in excess of its fair market value shall be paid or allowed for any used machine offered for sale by the prospective customer for a new machine." The practice of distributing and circulating to the entire industry published current price lists, including all notices of advance or decline in prices made by any individual manufacturer, has been approved.

The New York chapter of the American Society for Steel Treating will visit the Bell Telephone Laboratories, New York, March 11, for a demonstration of television.

Plates

Mills in Chicago District Operating at Capacity First Time Since War—Eastern Market Active

PLATE demand shows considerable improvement in the Middle West and eastern districts. Plate mills at Gary, South Chicago and Indiana Harbor are operating at capacity for the first time since the war. About 25,000 tons of pipe line work was booked at Chicago during the week. Car and tank contracts also account for heavy tonnages. Eastern mills obtain some Chicago business.

PLATE PRICES, PAGE 481

New York, Feb. 12.—Plate demand is active. Standard Oil Co. of New Jersey is in the market for about 2500 tons of plates for delivery to Sarnia, Ont. Platemakers are encouraged by the continued good demand for cars, and by the fact car inquiries involve at least 150,000 tons of steel, largely plates. There is talk of a $2 a ton advance shortly, but in the meantime the price continues 2.00c to 2.10c, base, Coatesville, equivalent to 2.17½c to 2.27½c, delivered New York. A notable feature is the extent to which differentials under the market price have been reduced or eliminated. On the average, large customers are paying higher prices, in comparison with the regular market price, than at any time since the war. Not more than 2 per cent of the individual buyers in this territory are paying below 2.00c, base, Coatesville. Certain mills maintain backlogs equivalent to two to three weeks' production.

Philadelphia, Feb. 12.—Plate demand continues brisk, eastern mills operating at 65 to 70 per cent. Two of them are not promising shipments before two or three weeks. Prices continue 2.00c to 2.10c, base, Coatesville, subject to occasional differentials. Improved demand for locomotives has a bearing on the plate market. The Baldwin Locomotive Works booked 15 for the Chesapeake & Ohio and ten for the Chicago & North Western. Locomotive inquiries include 15 for Chicago, Milwaukee & St. Paul and ten for Pere Marquette. All these locomotives will require about 40 tons of plates each. Platemakers also are interested in shipbuilding prospects. The De Gorgio Fruit Co. has received inquiry for two large vessels. It is believed that the purchase by the Export Steamship Corp. of vessels from the shipping board will not prevent that company from placing new vessels, as previously planned.

Pittsburgh, Feb. 12.—Plate specifications are fair. Demand generally is for miscellaneous purposes, although activity in barge building is providing steady tonnage. Plates hold to 1.90c, base, Pittsburgh.

Cleveland, Feb. 12.—Plate demand has not yet reached proportions that tax mill capacity. Deliveries, compared with bars or shapes, are easy. While a local mill can deliver ordinary orders within a week, nearby mills supplying this market to a cer-

tain extent quote 10 days to two weeks. Boiler shop tonnage is light. Locomotive shop needs are increasing. The Lima Locomotive Works is understood not to have placed its order but it is ready for issuance. Plates are generally 1.90c, Pittsburgh.

Chicago, Feb. 12.—With plate mills at Gary, South Chicago and Indiana Harbor at capacity the first time since the war, and more car, oil and pipe line tonnage to be placed, indications are purchasers must expect more deferred deliveries. Mills are seeking to adjust rolling schedules in specific sizes to 30-day periods, making it possible for buyers coming into the market for sizes that happen to be on the rolling schedule to get material fairly promptly. About 25,000 tons of pipe line work was placed on plate mill books during the week. The 12,000 tons for the Denver water line still is pending. About 1500 tons of oil storage work was booked for the Southwest. In addition to the heavy tonnage on mill books about 15 boiler and heating plant manufacturers are taking considerable plate tonnage in western territory. General manufacturing lines also are active. Some business has been taken in this territory by eastern mills, which are obtaining up to 2.10c a promise to make quick delivery. The market is steady at 2.00c to 2.10c, Chicago, except for oil tank business in competitive territory in the Southwest and on the Pacific coast.

The Wisconsin Gas & Electric Co., Racine, Wis., is about to place contracts for a 3,000,000-cubic-foot gas holder, 155 x 175 feet. to cost $200,000.

CONTRACTS PLACED

510 tons, sheet piling, plant on Brunot island, Duquesne Light Co., Pittsburgh, to the Jones & Laughlin Steel Corp.

450 tons, including some shapes, comprising two barges, 250 tons; two caissons, 150 tons; miscellaneous equipment 50 tons; for Whiting, Turner Construction Co., Baltimore; to Dravo Contracting Co.

200 tons, motorship W. B. FOSHAY, to A. M. Castle & Co.

104 tons, 30-inch riveted steel pipe, Glendale, Calif., to Lacy Mfg. Co.

CONTRACTS PENDING

1970 tons, 38 and 48-inch welded steel pipe, Spokane. Bids soon.

2000 tons, sheet piling, Long Beach, Calif.; bids opened.

Byers' Plant Under Way

Pittsburgh, Feb. 12.—Ground was broken yesterday at Ambridge, Pa., near here, for the new plant of the A. M. Byers Co., to cost $10,000,000. Dr. James Aston, inventor of the Aston process for making wrought iron, turned the first shovelful of ground. Secretary of Labor J. J. Davis was the principal speaker. The plant, to employ 1000 persons, will be completed in a year.

Pipe

Youngstown to Buy 13,000 Tons —Prospects Bright for Other Early Spring Lettings

YOUNGSTOWN, O., commissioners are studying various tenders submitted on aqueduct requirements involving 13,000 tons of pipe, including the $36 low bid on cast pipe by the United States Cast Iron Pipe & Foundry Co. Borough of Queens, N. Y., will ask tenders shortly on 5000 tons. Several small lots are pending in the West, a few having reached general contractors.

PIPE PRICES, PAGE 482

New York, Feb. 12.—Specifications will be issued shortly on 4000 to 5000 tons of 6 to 30-inch class B pipe for the Borough of Queens, the first sizable tonnage to be inquired for by this city this year. Municipal demand continues slack and private inquiry also is featureless. Prices are unchanged.

Youngstown, O., Feb. 12.—Alternative bids have been received by the Mahoning valley sanitary district on a large tonnage of cast iron or steel pipe for a twin force main from the Meaner storage reservoir to the Perkins Corners reservoir here to furnish water to Niles and Youngstown. Bids from 26 contractors were $200,000 to $350,000 below engineers' original estimates. Cast pipe includes 12,560 tons of 36-inch, 320 tons of 48-inch and 425 tons of fittings. Bids also were taken on 16 tons of 24-inch and 30 tons of 8-inch standard pipe. The commissioners now are studying the following bids and may let contracts before the week ends:

Cast pipe: United States Cast Iron Pipe & Foundry Co., $36 a ton on the 36 and 48-inch cast pipe. French makers through W. Neilson, Columbus, O., $39.55 delivered. The United States company through its Pittsburgh office bid on standard pipe a total of $516,961; and for high tensile strength pipe, $463,102.

Smooth bore steel pipe electrically welded: Pennstock Construction Co., subsidiary, Petroleum Iron Works, Masury, Pa., $583,053; Biggs Boiler Works Co., Akron, O., $636,368.50; and Victor Olsen Contracting Co., Youngstown, $644,145.

Smooth bore steel pipe riveted: Young & Kesecker, Youngstown, $649,191.70; Youngstown Boiler & Tank Co., $657,421.45; and Robeck, Humphreys Construction Co., $688,922.

Steel cylinder reinforced concrete pipe: Lock-Joint Pipe Co., Ampere, N. J., $678,166.50; and Charles F. Smith & Son Co., Dayton, O., $919,464.

Pittsburgh, Feb. 12.—A steady demand for seamless pipe for oil field use is being received by mills. Welded material, however, continues slow. Merchant pipe jobbers are turning over their stocks in fair volume. Demand for mechanical tubing is steady with increased commitments being received from the automotive field. A fair volume of boiler tubing business is being received. Several line pipe jobs still are pending but awards are lacking.

Cleveland, Feb. 12.—A few single carloads of pipe were placed with mill representatives here by jobbers, who aim to maintain well balanced stocks, pending the breaking of increased spring demands.

Chicago, Feb. 12.—A western railroad is taking bids on 300 tons of 4 to 36-inch cast iron pipe. Several small municipalities in Indiana and Illinois are buying through contractors. Avon and Rochelle, Ill., will vote soon on bond issues for improvement work to include pipe laying. Chicago public works department is understood to be preparing a large inquiry. The Milwaukee sewage commission awarded the general contract on 400 tons of 36-inch pipe. No weakness is shown in the carload prices of larger sized pipe at $45.20 to $46.20, delivered Chicago.

Birmingham, Ala., Feb. 12.—Cast iron pipe bookings again are heavier than shipments. Output is being increased, anticipating a heavy movement in March. Quotations still are $37 to $38 per ton, 6-inch and over sizes.

CONTRACTS PLACED

CAST PIPE

169 tons, 4 and 6-inch class B, Toledo, Wash., to Pacific Waterworks Supply Co.

CONTRACTS PENDING

4000 to 5000 tons, 6 to 30-inch class B pipe, Borough of Queens, New York; specifications expected out within two weeks.

2242 tons, 12-inch class A, B and C, Southern Pacific Co., San Francisco; bids opened.

1103 tons, 2 to 12-inch class B, East Bay municipal utility district, Oakland, Calif. Bids opened.

400 tons, 36-inch pipe, Milwaukee sewage commission, to Mierswa Co., general contractor.

338 tons, 4 to 12-inch class B, Aanaheim, Calif. Bids Feb. 14.

300 tons, 4 to 36-inch pipe for an unstated western railroad.

219 tons, 6 to 16-inch class B and C, improvement, Thirty-sixth avenue, southwest. Bids opened.

200 tons, 6 to 12-inch class B and C pipe, Hartford, Conn.

119 tons, 8-inch class B, Eureka, Calif. Bids opened.

100 tons, 6 to 8-inch pipe for Laurel, Ind.;

bids in.
100 tons, 6 to 8-inch pipe for Elgin, Ill.; bids in.

Tin Plate

Operations Close to 90 Per Cent—Sales in Usual Volume

TIN PLATE PRICES, PAGE 481

Pittsburgh, Feb. 12.—Tin plate demand is steady and operations are maintained at close to 90 per cent. Considerable material has been produced in anticipation of future requirements, but it will be another month or more before canmakers' needs for material begin to increase. Other lines are buying in about their usual volume. Tin plate continues $5.35 per 100-pound base box, Pittsburgh.

Bolts, Nuts, Rivets

Production at Heavy Rate and Prices Are Steady

NUT AND BOLT PRICES, PAGE 482

Chicago, Feb. 12.—Producers are receiving slightly heavier specifications from buyers of large structural rivets on the 3.00c quotations. Specifications for bolts and nuts are fully up to February last year. The outlook is good, particularly from farm equipment and tractor makers. Western operations are continuing at 65 to 70 per cent, the rate that has prevailed since early in January. Bolt and nut prices are steady at 60 to 70 off. Small rivets are 70 to 70 and 10 off.

Philadelphia, Feb. 12.—Rivetmakers generally quote 3.10c, base, Pittsburgh, on new business but this does not affect business on books at 2.90c, Pittsburgh, and in some cases lower. Bolt and nut demand is active with mills at 70 per cent, the best in years.

New York, Feb. 12.—Several rivetmakers now are quoting 3.10c, base, Pittsburgh, on new business. The advance has had the effect of increasing specifications for shipment against contracts, most of which are at 2.90c, base, Pittsburgh, and in some cases lower.

Pittsburgh, Feb. 12.—Rivet specifications are more active, with material moving more freely to jobbers and for steel construction work. The recently announced price of 3.10c, Pittsburgh, for large rivets, finds little application since practically all orders are applied against contracts. Bolts and nuts continue 60 to 70 off.

Cleveland, Feb. 12.—High operating rates continue among nut and bolt makers. Different consuming lines are represented, as are jobbers. The automotive trade is well represented. Prices are unchanged and firmer. Rivet activity consists mainly of specifications against 2.90c arrangements, the 3.10c figure being untested. The latter probably will not fully apply until second quarter bookings take place.

Sheets

All Grades, Except Full-Finished Advanced by Some Independents—Demand Heavy

SEVERAL important independent sheet producers have advanced prices $2 a ton on all grades, except full finished, for the remainder of this quarter. Other independent mill interests, which are booked practically full for this period and therefore less affected, are waiting developments. The leading interest has not made an announcement. Delivery lags most on the high finishes.

SHEET PRICES, PAGE 481

Pittsburgh, Feb. 12.—Sheet specifications are steady, and despite continued high operations deliveries have not been shortened. Demand for full finished material still is active and some mills are unable to make shipments in less than five to six weeks on normalized steel. Tonnage moving to all of the larger consumers is regarded as normal for this period. Farm implement manufacturers continue heavy consumers. Although aggregate commitments from the automotive industry are heavy, operations by some companies are considerably ahead of others. Prices continue firm with the exception of occasional shading by several small mills which are only occasionally active in the market. Current prices generally are 2.85c, base, Pittsburgh, for sheet mill black, 3.00c for tin mill black; 3.60c for galvanized, 2.10c for blue annealed, and 4.10c for full-finished. The leading sheet producer has no announcement to make at this time, following the action of several independents in advancing prices on all grades $2 a ton, except full-finished, for delivery the remainder of this quarter. Operations continue around 95 per cent.

New York, Feb. 12.—Sheet demand continues heavy, and most mills have no difficulty in keeping their rolling schedules full. Two large mills are scheduled full until well into March, and another producer cannot promise deliveries until April. There is talk of a $2 advance in sheet prices.

Philadelphia, Feb. 12.—The sheet situation became clarified today when the Alan Wood Iron & Steel Co. announced an advance of $2 a ton on blue annealed sheets, making this grade 2.20c, base, Pittsburgh, effective immediately. In some quarters the advance was expected to apply to all grades of sheets. A number of sheet mills are prepared to book second quarter contracts at prevailing prices, except for an advance of $2 on blue annealed. Sheet demand continues active. Mills in some instances are unable to promise shipment before the last week of March or first week of April.

Youngstown, O., Feb. 12.—The price advance of $2 a ton on common black, blue annealed and galvanized sheets announced by some independent valley makers yesterday, appears of secondary importance at present in view of the huge volume of inflowing orders and specifications. One important maker last week received the heaviest influx of such orders in its history, exceeding even wartime business. While makers of autobody sheets are under heavy pressure from automotive interests, common black and blue annealed sheets also are in good demand. Some plants here have notified sales offices they can book no more full-finished business for delivery before April 1. Makers of common grades are filled for two to three weeks.

The new quotations which some independent mills in the valleys are naming on sheets, effective immediately on new business and for second quarter, are: Common black 2.95c, Pittsburgh, blue annealed 2.20c and galvanized 3.70c.

Cleveland, Feb. 12.—Sheet orders and specifications are taxing mill capacity and delivery dates have become matters of chief concern. Numerous buyers have presented tonnage without mentioning price. Some mills with delivery dates on high grade sheets requiring three to four weeks in processing have had to turn this business down; they named dates as far ahead as the week ended May 11. Demand is particularly heavy for automotive grades but stove and range manufacturers as well as electric refrigerator manufacturers are actively specifying on electrical sheets, enameling stock. While some mills have advanced blue annealed only, going to 2.20c, Pittsburgh, others have inaugurated a $2 advance on black and galvanized as well. Full finished, however, remains at 4.10c, Pittsburgh.

Chicago, Feb. 12.—Despite sheet specifications of week-to-week range the volume is surprising. Operations are continuing at 80 to 85 per cent. One group of hot mills did not resume Monday after closing for the week-end, as steel for sheet bars was diverted, but started full operations Tuesday for the rest of the week. The character of new orders adjust rolling schedules to a better basis. Sheet jobbing is active. Chicago delivered quotations are steady at 3.00c for No. 24 black, 3.75c for No. 24 galvanized, and 2.25c for No. 10 blue annealed, with Gary and Indiana Harbor mill prices $1 a ton less.

St. Louis, Feb. 12.—Manufacturers and distributors of sheets report fairly satisfactory conditions in all departments. Blue annealed and black are the most active. Prices are unchanged.

Structural Shapes

Aggregate of Pending Work Assures an Active Spring—Awards in 1000-5000 Ton Class Fairly Numerous—1.90c Price Prevails

IF ALL structural work now projected if not already in actual inquiry form materializes, fabricators and mills alike face an exceptionally busy spring and summer. Many owners intend to close soon on structures wanted in order to obtain suitable steel deliveries, which already are on a two to three-week basis. Numerous awards this week take 1000 to 5000 tons apiece. The Eddystone, Pa., steel foundry tonnage is 11,000 instead of 7000. A total of 7920 tons is involved in two subway lettings in the East. Chicago reports more than 15,000 tons in new inquiries. An office building for the Pennsylvania railroad may take 10,000 tons. March 1 is the closing date on the 12,000-ton court house at Milwaukee. Quotations in the main, are firm at 1.90c, base, Pittsburgh.

STRUCTURAL SHAPE PRICES, PAGE 481

New York, Feb. 12.—Structural tonnages were scarce here the past week. In fact, orders and inquiries generally were not numerous, with the totals in both cases substantially under a week ago. However, in view of the work under contemplation trade sentiment continues firm. Shape prices are unchanged at 2.145c to 2.195c, New York.

Boston, Feb. 12.—While no structural awards of size took place during the past week, work involving about 1500 tons is pending. Contracts are expected to be placed soon. Scattered small tonnages were numerous. Much of this business was taken at relatively low prices, but it engages operations at plants for the time being. The General Baking Co.'s new building at Worcester, Mass., will take 700 tons; a printing plant at Orange, Conn., 500 tons; a new structure for the Providence National bank calls for 125 tons, and three new bridges for Vermont will account for 130 tons.

Philadelphia, Feb. 12.—Shape demand has improved somewhat, with eastern mills operating 75 to 85 per cent, but prices are not too strong. In fact, the tendency in carload sales has been slightly downward and the current market delivered Philadelphia now may be quoted around 2.01c, base, delivered, or $1 per ton less than before with large tonnages continuing to enjoy further differentials.

Buffalo, Feb. 12.—Two hotel projects will result in large fabricating orders at an early date. Considerable small business likewise is pending and fabricators look for a busy spring.

Pittsburgh, Feb. 12.—Specifications for plain structural material are in fair volume. Operations of fabricators are steady, but new business lags. This condition is regarded as only temporary, although inquiry is slow to expand. The East street bridge, taking 3000 tons, went to the Independent Bridge Co., otherwise awards are small. A fair volume of work is pending. Shapes continue 1.90c, Pittsburgh.

Chicago, Feb. 12.—Purchases of structural steel for the MacChesney building and the American Bankers Insurance Co. building, Chicago, aggregate 4000 to 5000 tons. Bids for the 12,000-ton court house in Milwaukee close March 1. About 15,000 to 18,000 tons came out in fresh inquiry and 6000 to 7000 tons is pending on jobs now reaching the active stage. Structural mill operations are at a higher rate than at the beginning of the month, although the tonnage could be increased if mills were able to schedule more heavy material. The price range is 2.00c to 2.10c, Chicago, with the 2.10c price nominal.

Cleveland, Feb. 12.—Awards are at the lowest ebb of the year. Tonnage pending is large and within the next few weeks, as weather conditions improve, bookings should increase materially. A 2500-ton building at Toledo is being revised. A 1500-ton telephone building at Akron is to be closed this week. Hunkin-Conkey Construction Co. will place 200-250 tons for motor generator stations for the Cleveland Union Terminals Co. this week and the East Cleveland high school, 700 tons, likewise will be let. Specifications keep up fairly well. Mill deliveries are a little more extended on the basis of two to three weeks. Prices are firm at 1.90c to 1.95c, Pittsburgh, with tonnage favoring the minimum.

Awards Compared

	Tons
Awards this week	40,903
Awards last week	38,603
Awards two weeks ago	39,980
Awards this week in 1928	59,348
Average weekly awards, Jan.	35,583
Average weekly awards, 1928	39,082
Average weekly awards, 1929	35,346
Total awards to date, 1928	322,054
Total awards to date, 1929	247,422

CONTRACTS PLACED

14,400 tons, instead of 14,000 tons as previously noted in IRON TRADE REVIEW of Feb. 7, Strawbridge & Clothier Co. store, Philadelphia, to American Bridge Co.

11,000 tons, instead of 7000 tons as previously reported in IRON TRADE REVIEW of Jan. 31, building, American Steel Foundries, Eddystone, Pa., to American Bridge Co.

4250 tons, subway, route 101, section 6, New York, to Bethlehem Steel Co.

3670 tons, subway, route 109, section 5-A, New York, to American Bridge Co.

3300 tons, MacChesney building, Chicago, to Gage Structural Steel Co.

3000 tons, East street bridge, Pittsburgh, to Independent Bridge Co.

2500 tons, Park Plaza hotel, St. Louis, to Mississippi Valley Structural Steel Co.

2100 tons, Continental Life Insurance building, St. Louis, to Mississippi Valley Structural Steel Co.

2000 tons, power plant, Pennsylvania railroad, Philadelphia, to Shoemaker Bridge Co.

2000 tons, building, Continental Life Insurance Co., Grand and Olive streets, St. Louis, to Mississippi Valley Structural Steel Co.

1975 tons, kiln and mill buildings, 1700 tons and power house, 275 tons, Murray Wood Products Co., Memphis, Tenn., to Virginia Bridge & Iron Co.; noted last week as 1475 tons.

1850 tons, office building, Wilmington, Del., to McClintic-Marshall Co.

1447 tons, carton plant at Beacon, N. Y., for National Biscuit Co., to American Bridge Co., through John W. Cowper Co., general contractor.

1000 tons, school No. 233, New York, to Harris Structural Steel Co.

1000 tons, school No. 142, Queens, N. Y., to Harris Structural Steel Co.

920 tons, American Bankers Insurance Co. building, Chicago, to Duffin Iron Co.

900 tons, hangar, Transcontinental Airways Corp., Dodge City, Iowa, to Mississippi Valley Structural Steel Co.

900 tons, hangar for Transcontinental Airways Corp., East St. Louis, Ill., to Stupp Bros. Bridge & Iron Co.

687 tons, building, California National bank, Beverly Hills, Calif., to Consolidated Steel Corp.

500 tons, garage, New Rochelle, N. Y., to Easton Structural Steel Co.

445 tons, warehouse, Louisville & Nashville railroad, Pensacola, Fla., to Virginia Bridge & Iron Co.

430 tons, apartment building, Second avenue and 320 East Fifty-third street, New York, to McClintic-Marshall Co.

400 tons, bridge for Southern railway in Kentucky, to Virginia Bridge & Iron Works.

400 tons, building for John David, clothier, Sixth avenue and Twenty-second street, New York, to Hinkle Steel Construction Co.

300 tons, bracing for piling, Brunot Island station, Duquesnes Light Co., Pittsburgh, to Jones & Laughlin Steel Corp.

279 tons, bunker building, Deer Park, Tex., Shell Petroleum Co., to Houston Structural Steel Co.

275 tons, including double machine building, 200 tons, DuPont Engineering Co., Waynesboro, Va., and store building, 75 tons, Wood Construction Co., Roanoke, Va., to Virginia Bridge & Iron Co.

250 tons, building Grigsby-Grunow Co., Chicago, to Reuter Bros.

225 tons, building, Borden Farm Products Co., Forest Park, Ill., to Midland Structural Steel Co.

200 tons, motorship W. B. FOSHAY, to A. M. Castle & Co.

150 tons, school, Sacramento, Calif., to Moore Drydock Co.

125 tons, Priebe apartments, Milwaukee, to Milwaukee Structural Steel Co.

100 tons, radio manufacturing plant, Westinghouse Electric & Mfg. Co., East Springfield, Mass., to Haarman Steel Co.

100 tons, Bon Marche Marquees and Kress building, to Isaacson Iron Works.

100 tons, crusher building at Dunbar, Pa., New Castle Lime & Stone Co., New Castle, Pa., to William Fleming Sons.

100 tons, machine shop addition, Cadillac Motor Car Co., Detroit, reported awarded Russel Steel Construction Co. through A. A. Albrecht Co., general contractor.
100 tons, plate girders for Union Pacific railroad, to McClintic-Marshall Co.

CONTRACTS PENDING

6000 to 10,000 tons, office building, Pennsylvania railroad, Seventeenth and Market streets, Philadelphia.
3500 tons, plaza for subway, Philadelphia.
2500 tons, building, Libbey-Owens Sheet Glass Co., Toledo, O. General contract to A. Bentley & Sons. Plans being revised.
2500 tons, mill building, Interstate Iron & Steel Co., South Chicago, Ill.
2200 tons, including 700 tons of columns, for Van Castle apartments, Tarrytown, N. Y.
2000 tons, apartment hotel, 1240 Lake Shore drive, Chicago.
1800 tons, trestle, Duluth, Mesabi & Northern railroad, Duluth.
1400 tons, car repair shop, Chicago, Milwaukee, St. Paul & Pacific railroad, at Milwaukee.
1000 tons, addition, Franklin exchange, Illinois Bell Telephone Co., Chicago.
1000 tons, building at Akron, O., for Ohio Bell Telephone Co.; to be let this week.
850 tons, St. Benedict's convent, Lisle, Ill.
800 tons, apartment, 1200 Stone street, Chicago.
700 tons, building, General Baking Co., Worcester, Mass.
700 tons, East Cleveland, O., high school; general contract to be let this week.
600 tons, plant for Anaconda Copper Mining Co., at International, Utah.
500 tons, Kress building, Wichita, Kans.
500 tons, additions and buildings, City hospital, Providence, R. I. Bids opened March 4.
500 tons, printing plant, Orange, Conn.
500 tons, First National bank building, Binghampton, N. Y.
500 tons, plant building for National Electric Co., Bayway, N. J.
500 tons, 10-story addition to Warner Bros. building, 22 West Forty-fourth street, New York.
450 tons, highway bridge at Coldwater, Ariz.
400 tons, Franklin building, Eleventh and Wells streets, Milwaukee. Bids close Feb. 14.
250 tons, warehouse, Western Electric Co., Emeryville, Calif. Bids opened.
200 tons, dairy products building, Nickel Plate Development Co., Cleveland; bids soon.
200 tons, motor generator stations, Cleveland Union Terminals Co., Cleveland; general contract to Hunkin-Conkey Construction Co.
200 tons, building for General Baking Co., Worcester, Mass.
200 tons, office addition for New York Edison Co., Hester and Norfolk streets, New York.
179 tons, bridges, highway department, Phoenix, Ariz.; bids opened.
130 tons, three bridges for Vermont.
125 tons, warehouse and garage, Kneeland Motor Express Inc., Springfield, Mass. General contract to be awarded this week.
125 tons, bank building, Providence National bank, Providence, R. I.
100 tons, men's dormitory, Wooster college, Wooster, O.; general contract to Crowell & Little Construction Co.
100 tons, building for the Wovenright Knitting Co., Cleveland; general contract to De Hamel Construction Co.
100 to 150 tons, plant in Cleveland for the Liquid Carbonic Corp., Chicago. General contract awarded the H. K. Ferguson Co.

Doherty Options Iron Ore Lands in Texas

An optional contract between Henry L. Doherty & Co., New York, and the East Texas Iron Co. for the purchase from the latter of 10,000 acres of iron ore land in Cass county, Texas, has been filed at Linden, seat of Cass county. It is stated at Linden that development of this iron ore deposit will be followed by the construction of an iron and steel plant.

Investigation by engineers is said to disclose approximately 50,000,000 tons of high grade iron ore. According to the contract, Henry L. Doherty & Co. have nine months in which to exercise their option.

Concrete Bars

Weather Retards Bookings —Big Chicago Job Goes Rail Steel—Prices Steady

SNOW and ice are doing their part to retard concrete bar activity in various sections. A fair amount of business is being done despite adverse weather conditions. Pending inquiries are numerous, involving 100 to 1500 tons at a time. One job at Washington taking 1400 tons was awarded, while one at Chicago, involving 1500 tons, went rail steel. Prices trend toward firmness.

REINFORCING BAR PRICES, PAGE 481

Chicago, Feb. 12.—Reinforcing bar activity is being slowed down by delay in connection with a few projects. Snow and ice hinders progress in building operations. The market is featured by a 1500-ton rail steel award for the Montgomery Ward & Co. building, Chicago. Current awards are light. Six school buildings are pending here and it is understood that at least 350 tons will be awarded soon for the local board of trade building. The general contract has just been closed. Billet reinforcing bar prices are steady at 2.35c for lots of 100 tons and over, while rail steel bars are 2.05c.

Pittsburgh, Feb. 12.—Although a number of jobs involving large tonnages of concrete reinforcing bars are pending, awards continue restricted to small lots. Inquiry is only fair, particularly in this immediate vicinity. Tonnage received by mills is slightly smaller than last month. The closing up of some pending work would immediately alter this situation. Prices are well maintained at 2.25c, Pittsburgh, for cut lengths and 2.00c for stock lengths.

Cleveland, Feb. 12.—Concrete bars for the terminal warehouse at the foot of East Fifty-fourth street, 400 to 500 tons, have been let to the Bourne-Fuller Co. by the Nicholson Universal Steamship Co. A few other small jobs have been awarded but market improvement generally awaits better weather. Most quotations are on the basis of 1.90c to 2.00c, Pittsburgh, for mill lengths. Occasionally a 1.85c to 1.95c, Cleveland, base, price appears.

Awards Compared

	Tons
Awards this week	5,150
Awards last week	5,940
Awards two weeks ago	3,500
Awards this week in 1928	10,445
Average weekly awards, Jan.	7,288
Average weekly awards, 1928	6,189
Average weekly awards, 1929	6,780
Total awards to date, 1928	43,865
Total awards to date, 1929	47,530

CONTRACTS PLACED

1500 tons, rail steel bars, building, Montgomery Ward & Co., Larrabee street and Chicago avenue, Chicago, to Calumet Steel Co.
1400 tons, internal revenue building, Washington, to McClintic-Marshall Co.
400-500 tons, terminal warehouse, East Fifty-fourth street and Lake front, Cleveland, Nicholson Universal Steamship Co., Detroit, to Bourne-Fuller Co.
400 tons, apartment, Ninth and Serrano streets, Los Angeles, to unstated interest.
400 tons, apartment, Glen Lake avenue and Sheridan road, Chicago, to Inland Steel Co.
350 tons, apartment, Normandie avenue and Wilshire boulevard, Los Angeles, to unstated interest.
175 tons, Charles apartments, Bellingham, Wash., to Northwest Rolling Mills.
175 tons, work for Cleveland Union Terminals Co., Cleveland, to Bourne-Fuller Co.
100 tons, office building, Boeing Airplane Co., Seattle, to Pacific Coast Steel Co., through the Austin Co.
100 tons, miscellaneous jobs, Cleveland and vicinity, including fruit auction building, Nickel Plate Development Co., Cleveland, to Republic Structural Iron Works.
100 tons, footings, Nickel Plate railroad, East Fifty-fifth street bridge, Cleveland, to Paterson-Leitch Co.

CONTRACTS PENDING

875 tons, bridges, Pennsylvania railroad.
550 tons, county jail, Holmesburg, Philadelphia.
500 tons, building, Ohio Bell Telephone Co., Akron, O. Bids from 14 contractors already filed.
400 tons, carton building, National Biscuit Co., Beacon, N. Y. General contract to John W. Cowper Co., Buffalo.
344 tons, United States engineers, Milwaukee. Bids close Feb. 14.
350 tons, board of trade building, Chicago. General contract to Hegeman-Harris Co.
210 tons, American Bankers Insurance Co. building, Chicago. Childs & Smith architects.
190 tons, apartment, Geary and Shannon streets, San Francisco. Bids being received.

Discuss Foreign Trade

A preliminary program for the seventh National Foreign Trade convention has been announced by the National Foreign Trade council. The meeting will be held in Baltimore, April 17-19, all sessions to be held at the new Lord Baltimore hotel. James A. Farrell, president of the National Foreign Trade council, will preside and will make his customary address on "World Trade Today and Tomorrow." During the three days all phases of American export business will be taken up and in particular, Latin America will be discussed.

32 Open Hearths Active

Buffalo, Feb. 12.—Steelworks operations continue heavy. Of 37 open hearths 32 were making steel this week.

Rails, Cars

February Slated to Run Up Record Car Award Total—Illinois Central Distributes Total of 2950

FEBRUARY car lettings in 10 days exceeded 10,000 units and if present rate keeps up, this month is destined to outstrip any month in past two or three years. Although other sections benefit, western mills will furnish most of the steel. Illinois Central has awarded 2950. Other roads close bids before Feb. 28 on 5000 to 10,000 cars. Anthracite mines buy light rails.

RAILROAD TRACK PRICES, PAGE 482

New York, Feb. 12.—Continued activity in the car market has brought total freight car awards so far this month up to around 8000 and places the total awarded since Jan. 1 at more than 21,000. Meanwhile, inquiry continues promising, with the New York Central expected in the market for a substantial number of freight cars within the next 30 days. The Pennsylvania contemplates the purchase of 1000 freight car bodies, but, so far as can be learned, has not as yet issued a formal inquiry.

Complete returns show that 13,196 freight cars were placed in January by domestic railroads. This is the largest total since December, 1927, when 14,897 cars were placed. Further comparisons follow:

	1929	1928	1927	1926
Jan.	13,196	4,160	14,710	8,830
Feb.	.....	10,220	5,960	12,895
March	.....	2,958	4,955	8,895
April	.....	6,043	3,675	4,615
May	.....	2,531	5,425	4,448
June	.....	2,422	7,440	4,285
July	.....	582	2,295	1,265
Aug.	.....	677	1,181	152
Sept.	.....	1,378	682	3,335
Oct.	.....	2,853	886	2,840
Nov.	.....	6,140	1,189	3,925
Dec.	.....	4,799	14,897	8,990
Total	.....	44,763	63,295	64,475

Philadelphia, Feb. 12.—Considerable improvement in operations at anthracite mines has resulted in expansion in light rail buying. The usual selling price is $36, base, Pittsburgh, for billet-rolled rails and $34, base, mill, for rails rolled from old rails.

Pittsburgh, Feb. 12.—Specifications for track fastenings are in fair volume for this period. Plant operations generally are regarded as satisfactory. New business, however, is lacking. Light rail demand is steady but not brisk. Railroad spikes continue 2.80c, Pittsburgh. Pressed Steel Car Co. has received an order from the Pere Marquette railroad for 1000 box cars.

Chicago, Feb. 12.—Car awards by railroads since Dec. 1, 1928, place nearly 800,000 tons of steel on the books of western producers. The purchase of 2950 miscellaneous freight cars by Illinois Central and 200 for use on its Chicago & Illinois Western gives western mills over 70,000 tons of steel.

Among the 10,000 cars pending in the market are 4150 for Chicago, Milwaukee, St. Paul & Pacific. Bids on the St. Paul cars will be taken Feb. 16, and for the 1500 cars for the Texas & Pacific bids will close Feb. 19. Northern Pacific announces it will purchase a total of seven gas-electric cars this year, including five 300-horsepower.

Rail mill operations in the district stand at about 80 per cent. This rate could be increased if more raw steel could be used for rail departments. Last week was the best in three or four months in light rail purchases, due to accumulations of orders from coal and copper mining interests. Track fastenings purchases include 6000 to 7000 tons of tie plates and about 10,000 kegs of spikes in several lots for six western railroads.

St. Louis, Feb. 12.—Western and Southwestern railroads contemplate heavy expenditures in 1929. Three main trunk lines centering in this city will expend $36,368,280 in general property improvements. These are Missouri Pacific, the St. Louis & Southwestern, and Missouri, Kansas & Texas. The first plans to spend $25,250,000 while the others will lay out $4,604,339 and $6,513,921, respectively.

CAR ORDERS PLACED

Bradford Corp., 100 center constructions, to own shops.

Cuban company, 400 cane cars for shipment to Cuba, to Magor Car Corp.

Elgin, Joliet & Eastern, 250 gondolas, divided equally between Pressed Steel Car Co. and American Car & Foundry Co.: as noted last week, this railroad will build 75 flat car bodies in its own shops.

Illinois Central, 2950 cars awarded as follows: 750 50-ton hoppers to Pullman Car & Mfg. Corp., 700 40-foot automobile cars to American Car & Foundry Co., 425 70-ton hopper cars to Standard Steel Car Co., 300 50-foot automobile cars to Mt. Vernon Car & Mfg. Co., 200 50-ton flat cars to Bettendorf Corp., 375 70-ton hopper cars to General American Tank Car Corp.; and for the Chicago & Illinois Western, a branch line, 100 70-ton hopper cars to General-American Tank Car Corp., and 100 50-ton gondolas to the Ryan Car Co. Illinois Central will purchase passenger cars later.

Louisville & Nashville six baggage cars to Pressed Steel Car Co.

Pere Marquette, 1400, 1000 box going to Pressed Steel Car Co. and 400 gondolas to the Magor Corp.; 100 freight cars still to be purchased.

Texas Co., 675 tank cars, 375 going to American Car & Foundry Co. and 300 to Petroleum Iron Works.

Western Maryland, heavy repairs to 800 cars, to own shops.

LOCOMOTIVE ORDERS PLACED

Boston & Maine, five switching engines to Baldwin Locomotive Works.

Illinois Terminal railroad system, nine locomotives, including five 40-ton and four 80-ton, to own shops.

Pickands, Mather & Co., two switch engines, to Baldwin Locomotive Works.

Weyerhaeuser Timber Co., four locomotives, to Baldwin Locomotive Works.

CAR ORDERS PENDING

Chesapeake & Ohio, 577 70-ton hopper bodies, with repairs to trucks.

Chicago & North Western, 59 miscellaneous coaches, specifications out soon; list will include 25 horse cars, 24 suburban passenger cars, five combination passenger and baggage cars, four combination baggage and smoking cars, and one cafe car.

Chicago, Milwaukee, St. Paul & Pacific, 15 caboose cars and 10 passenger cars, inquiry out shortly. It closes bids Feb. 16 on 4150 cars.

Cleveland Railway Co., Cleveland, 100 street cars, to cost $1,800,000. Bids to be asked soon by Joseph H. Alexander, president.

New York Central, unstated number of freight cars, inquiry expected out within 30 days.

Pennsylvania railroad, 1000 freight car bodies, contemplated.

LOCOMOTIVE ORDERS PENDING

Chicago, Milwaukee, St. Paul & Pacific, 15 locomotives.

Southern Pacific, 16 locomotives.

Iron Ore

Stocks on Lower Lake Docks Low—Market Not Yet Open

IRON ORE PRICES, PAGE 482

Cleveland, Feb. 12.—Some consumers of Lake Superior iron ore will need tonnage earlier this year, owing to reduced conditions of stocks, at furnaces and lower lake docks. The dock balance Feb. 1 was 5,310,678 tons, 977,322 tons less than on the same day in 1927. Action on sales and prices for the new season is not expected for some weeks. The Lake Superior Iron Ore association reports the following receipts for the past season at lower lake ports, shipments therefrom, and tonnages remaining:

Buffalo No. Towanda	Receipts	Shipments	Dock balance Feb. 1, 1929
Port Colborn	4,337,313	20,943	3,383
Erie	653,233	666,161	59,645
Conneaut	8,437,401	8,299,045	1,673,229
Ashtabula	6,376,035	6,573,682	1,764,539
Fairport	1,839,171	1,931,377	248,088
Cleveland	9,375,764	6,207,247	1,046,634
Lorain	3,423,111	1,705,224	69,569
Huron	1,010,927	1,039,909	382,872
Toledo	1,503,387	836,082	62,714
Total	36,956,342	27,279,670	5,310,678
Comparative total 1 year previous	36,552,791	26,707,158	6,288,000

Allard Buys Langelier Co.

Herbert K. Allard, Edgewood, R. I., has purchased the Langelier Mfg. Co., Cranston, R. I., manufacturer of swedging machines and automatic drilling machinery. With his associates Mr. Allard will continue manufacture of this type of machinery. Mr. Allard will be president and treasurer of the new company. The Langelier business has been in operation for more than 40 years.

Wire

Manufacturers' Wire Maintains Steadiest Demand, with Other Products Marking Time

COLD weather in western agricultural sections is limiting sales of wire applying to that field, and general demand for fencing material is slow. Tonnages of wire for automotive use are understood to have been covered recently at a price. Nail stocks are large and demand is slow. Specifications against first quarter contracts at higher prices are awaited from some large users.

WIRE PRICES, PAGE 482

Chicago, Feb. 12.—Mill orders against first quarter contracts are fairly satisfactory, despite the present check in consumer buying in the West and Northwest by heavy snow. Manufacturers' wire is in moderately heavy demand. Western mill operations are holding well at 65 per cent. The price to large jobbers shows steadiness at 2.55c, Chicago or western mills, for bright plain wire, and $2.70 for wire nails.

Worcester, Mass., Feb. 12.—Specifications against first quarter wire contracts are expanding with most shipments complete on heavy business placed late in the year. New business has been placed at the new prices, 2.75c, Worcester, base, to dealers, for plain wire. Demand for specialty wire products and manufacturers' wire is brisk, although buying is generally well spread. There has been considerable spot buying. Mill stocks in most cases are reduced. Considerable volume has been placed for limited lots which command top prices.

New York, Feb. 12.—Specifications against first quarter steel nail contracts have started well and help establish the new price of nails at $2.75, Pittsburgh, subject to the usual differential to large jobbers. Mills say new demand for nails is better than expected. Demand for plain wire for manufacturing purposes continues good, with the price firm at 2.50c, base, Pittsburgh.

Buffalo, Feb. 12.—Sales of wire are running more than 30 per cent ahead of the corresponding weeks of 1928. Demand for wire specialties is good, with works operating at high rates and with substantial unfilled tonnage. Prices are firm.

Pittsburgh, Feb. 12.—With shipments completed on fourth quarter contracts, wire and wire nail producers are awaiting resumption of new specifications. Some material ordered late last year has not been consumed, and some users have enough material for a short period. Others are operating well and are expected to be in the market shortly. Nail stocks in particular are fairly large. In the meantime, a steady flow of business is being received for manufacturers' wire. Demand for fencing and other wire products is slow to expand. Mill operations generally are unchanged. Prices continue 2.50c to 2.60c, Pittsburgh, for plain wire and $2.65 to $2.75 per 100 pound keg of wire nails.

Cleveland, Feb. 12.—Tonnage of wire products booked at the new figures is still limited to the day-to-day orders that come in from customers who did not protect themselves with contract coverage last December at the old prices. The 2.60c and $2.75, Cleveland-Pittsburgh, levels on wire and wire nails to dealers are widely quoted. Fence sales to Ohio rural districts are poor. Wire products prices have been shaded on automobile business in this district.

The will of the late David E. Weir, vice president of the Weirton Steel Co., Weirton, W. Va., includes a bequest for a hospital for that city. The estate is estimated at $5,000,000.

Cold Finished Steel

Steady Demand and Prompt Shipments Make Good Market

COLD FINISHED PRICES, PAGE 481

Pittsburgh, Feb. 12.—Steady demand continues the rule in cold-drawn steel. January shipments showed an increase over December and fairly prompt shipment can be effected. Specifications from automotive interests hold in fair volume. Prices are well maintained with 2.20c, Pittsburgh, prevailing.

Cleveland, Feb. 12.—While automotive tonnage, both direct and indirect, through parts makers, is holding up well in cold finished bars, other consuming lines likewise are taking at least their normal quotas. Road machinery manufacturers, household and office appliance manufacturers, all account for a heavy aggregate tonnage each week.

Funk & Wilcox Co., Boston, have the contract for reconstructing the Philadelphia arena in Market street. Remodeling to seat 17,000 people will cost $1,000,000.

Strip

Prices Advanced $2 but Most Users Covered Lower—Delivery Is Deferred

PRODUCERS of hot-rolled strip steel have advanced quotations $2 per ton, effective last Saturday. Most users are covered for first quarter and the new price applies now only on small current tonnages. Backlogs are heavy and delivery is deferred. Specifications are close to production rate and mills are not gaining against their orders. Some spot business is appearing.

STRIP PRICES, PAGE 482

Pittsburgh, Feb. 12.—Leading manufacturers of hot rolled strip steel have announced an advance of $2 a ton, effective immediately, to 2.00c on 6 inches and under and 1.90c on 6 1/16 to 24 inches. Contracts still are in effect at lower levels and the new prices will not have full application until next quarter. Some spot business has been appearing, however, and on all new inquiries the higher prices are being quoted. Demand continues active and backlogs hold to previous high levels. Delivery of four to five weeks generally is promised, and new orders approximate shipments. Backlogs of cold-rolled strip are heavier than on hot, and six to eight weeks generally represents delivery promise on all new business. Cold-rolled strip producers now ask 2.95c, Pittsburgh.

Youngstown, O., Feb. 12.—Two important valley makers of strip have announced an advance of $2 on hot-rolled to 1.90c and 2.00c, Pittsburgh. Other makers have moved their price on cold-rolled strip in line with previous announcements to 2.95c, Pittsburgh-Cleveland. These new prices are effective at once on new business and also for second quarter.

Cleveland, Feb. 12.—Some strip steel mills have all the tonnage they can handle in the first quarter, particularly of cold. Makers are now a unit in quoting the 2.95c, Cleveland-Pittsburgh. A similar advance of $2 has been inaugurated on hot strip.

Chicago, Feb. 12.—Hot strip mills are getting increased bookings in this district. One producer announces a $2 advance in hot-rolled strip quotations, effective as of Feb. 9. Prices now being quoted for the remainder of this quarter are 2.10c to 2.20c, Chicago, for 6 1/16-inch to 24-inch widths, and 2.20c to 2.30c for material 6 inches and under. Cold strip makers state 2.95c, Pittsburgh-Cleveland, is the minimum for cold-rolled strip, and that $2 a ton above that figure is being obtained for miscellaneous small lots. One producer now has a cold strip backlog of two weeks.

Nonferrous Metals

Large Buying Forces Copper and Lead Prices Up—Moderate Business Done in Other Lines

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Straits Tin—New York Spot	Straits Tin—New York Futures	Lead New York	Lead East St. Louis	Zinc St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
Feb. 6	17.75	17.87½	17.50	50.12½	50.12½	6.75	6.60	6.35	23.90	9.62½	35.00
Feb. 7	18.00	18.07½	17.75	49.50	49.50	6.75	6.62½	6.35	23.90	9.62½	35.00
Feb. 8	18.00	18.10	17.75	49.62½	49.62½	6.75	6.65	6.35	23.90	9.62½	35.00
Feb. 11	18.00	18.10	17.75	49.62½	49.62½	6.85	6.72½	6.35	23.90	9.62½	35.00
Feb. 12	Holiday										

NEW YORK, Feb. 12.—Copper and lead prices increased rapidly during the past week under pressure of large buying by domestic and foreign users. Business in other metals was moderate and aside from a reaction in tin, prices were unchanged.

Shipments of all metals continue large. In fact it is thought that copper statistics for January to be published this week will reveal the largest shipments ever made in any month. Back of shipments of all metals is large consumption in all lines of manufacture, with electrical and automobile outstanding factors.

Brass and copper product prices advanced with the copper market, and a few of the products of pure copper went up ⅛-cent more than virgin copper. Sheets were the most important among the latter items, wire rising with the base metal. Brass has moved up with copper, but as zinc has remained unchanged for some time, the differential between product prices and mixture costs, has been increased. The mills are unusually well booked and operating at the highest rates in many years.

Copper—Prices advanced ¼-cent twice in the past week to 18.00c, Connecticut, with the usual differentials for Midwest and Export. Buying was tremendous, so that producers are well sold through May. Users are similarly well covered, and so the domestic market has been rather quiet in the past few days. Export sales have continued active. The strength of the market will depend on the extent to which users want to do supplementary buying for shipment in the period from now to June 1. It is thought that January statistics will be a determining point for steadiness or strength.

Zinc—Prime western has sold moderately and prices have been steady. The market develops few features, and buying is done in a routine way. Sales of prime western in January by the dozen merchant producers who report to the American Zinc institute were 4755 tons for January shipment at 6.35c, E. St. Louis, and 17,158 tons for later shipment at 6.352c. Domestic shipments of slab zinc were larger during January than during any corresponding month since 1926, according to the report of the American Zinc institute. The movement was smaller than that of December, however. Production declined and stocks increased only 23 tons compared with statistics for the preceding month. January statistics as a whole show unusual stability.

Tin—Strength in tin a week ago was short-lived, for this week the market has lost much of its gain. It was the old story that the market cannot long remain strong without special support. Users have bought Straits sparingly.

Lead—Buying has been active this week and the price went up twice, 10 points each time, to 6.85c New York. Buying has been for prompt and March shipment from all classes of users. The London market has given good support.—*Daily Metal Trade.*

Mill Products

Base prices cents per pound f.o.b. mill, except where otherwise specified

SHEETS	
Yellow brass (high)	22.50
Copper, hot rolled	27.37½
Lead, full sheets (cut ¼c more)	9.50
Zinc sheet (100-uound base)	$9.75
Zinc strip (100-pound base)	$8.75
Aluminum, flat sheets, up to 10 gage, 3" to 72" wide	31.30
SEAMLESS TUBE	
Yellow brass (high)	27.37½
Copper	28.75
RODS	
Yellow brass (high, full turnings)	20.25
Naval brass	22.25
WIRE	
Copper, car lots	19.87½
Yellow brass (high)	22.50

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	11.50 to 11.75
Chicago	12.75 to 13.25
Cleveland	12.00 to 12.50
HEAVY YELLOW BRASS	
Cleveland	8.50 to 9.00
ZINC	
New York	3.50
Cleveland	3.00 to 3.50
HEAVY COPPER AND WIRE	
New York	15.00 to 15.25
Boston	14.75 to 15.00
Chicago	15.00 to 15.25
Cleveland	14.75 to 15.00
RED BRASS BORINGS	
New York	10.75 to 11.00
YELLOW BRASS TUBING	
Cleveland	9.25 to 9.50
LIGHT COPPER	
New York	12.75 to 13.00
Chicago	12.75 to 13.25
Cleveland	12.75 to 13.00
LIGHT BRASS	
Boston	7.50 to 7.75
Chicago	8.75 to 9.25
Cleveland	7.00 to 7.25
ALUMINUM	
Clippings, Cleveland	17.50 to 18.00
Borings, Cleveland	8.00 to 8.50
Cast, Cleveland	12.50 to 12.75
Cast, Boston	10.50 to 11.00

Secondary Metals

Remelt aluminum No. 12	16.50 to 17.00
Brass ingot, 85-5-5-5	16.25 to 16.75

Coke By-Products

Toluol Delivery Situation Still Tight—Naphthalene Demand Good

New York, Feb. 12.—Distributors of toluol are able to meet consumption, but with little to spare. Commercial xylol and solvent naphtha continue to relieve some of the pressure for toluol, particularly for manufacture. Routine buying characterizes business in phenol. Prices on light oil distillates generally are firm.

Spot demand for sulphate of ammonia continues dull, with little buying by either domestic or foreign consumers. Prices, meanwhile, are nominally unchanged at $2.30, delivered, for domestic account and $2.20, port, for material in double bags for export.

Ball and flake naphthalene is in good demand, with flakes firm at 5.50c to 6.50c, works, and balls at 6.50c to 7.50c. Sellers look for a moderately brisk demand to continue for the next several weeks, the drug trade covering on its spring cleaning requirements.

Coke Oven By-Products

Per Gallon at Producers' Plant in Tank Lots

	Spot
Pure benzol	$0.23
90 per cent benzol	0.23
Toluol (nominal)	0.40
Solvent naphtha	0.30
Commercial xylol	0.30
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.17
Per Pound at Producers' Plants	
Naphthalene flakes	0.05½ to 0.06½
Naphthalene balls	0.06½ to 0.07½
Per 100 Pounds Delivered	
Sulphate of ammonia	$2.30

Quicksilver Is Firmer

New York, Feb. 12.—Quicksilver is slightly firmer but quiet, at $121 to $121.50 a flask.

Warehouse

Steady Buying Rates Extend Mill Delivery Dates and Send Much Tonnage to Jobbers—Prices Are Firm in All Market Centers

STEADY calls are being made upon warehouse stocks by buyers of different kinds of steel in practically all market centers. Jobbers are aided by the gradually extending deliveries offered by the mills and the fact that all buyers cannot await the new dates.

New York—Firming up of prices on galvanized sheets is a feature among local warehouses. A few scattered orders still are noted at the recent concessions but the bulk of business is going at 4.75c. Black sheets appear little changed, with 3.90c to 4.00c, representative of the going market. Business generally continues more active. Most jobbers look for a continued improvement through March and possibly April, ordinarily the best months of the year. No action has yet been taken on strip steel. However, with advances just announced at Philadelphia of $2 and $1 a ton on strip and cold finished steels, respectively, the formed based on the mill advance, early revisions here are considered probable.

Philadelphia—Jobbers have extended Philadelphia base prices and quantity differentials to warehouse sales in Huntingdon and Mercer counties, New Jersey. This substantially expands the territory in which this method of selling prevails. Prices and quantity differentials are unchanged and firm, but the volume of business so far in February is under January.

Pittsburgh—Continued active buying for this period is reported by jobbers. Some products used for building purposes are slow, but demand for material for miscellaneous uses is good.

Buffalo—Sales continue on a broad scale. The year to date has produced a substantially larger volume of business than the corresponding weeks of 1928. Indications point to a very good first quarter.

Cleveland—Jobbers find that tonnage so far this month is ahead of the January rate and a greater number of orders is being received than last month. Every consuming line is represented. Prices are unchanged.

Cincinnati—A slight slackening in new business is noted, although current small orders are active. Shipments go forward steadily. No change in prices is indicated. The new railroad terminal here looms as the outstanding project, although no inquiries have as yet been made.

St. Louis—Developing some unevenness, due mainly to unfavorable weather, warehouse business holds up well. Improvement in buying by the general manufacturing trade has been a feature.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Baltimore	3.10c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Ft. Worth	3.75c
Houston	3.00c
Los Angeles	3.30c
New York†††‡	3.25c
Philadelphia*	2.80c
Pittsburgh	2.90c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.75c to 4.04c

IRON BARS

Baltimore	3.10c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
Ft. Worth	3.75c
New York††	2.80c to 3.24c
Philadelphia*	2.80c
St. Louis	3.15c
Tulsa	3.75c to 4.04c

REINFORCING BARS

Baltimore	3.31c
Boston	3.265c to 3.50c
Buffalo	2.75c
Cincinnati	3.15c
Cleveland	2.25c to 3.00c
Detroit	2.30c to 3.00c
Ft. Worth	3.50c
Houston	3.00c
Los Angeles cl.	2.65c
Los Angeles lcl.	3.00c
New York	2.85c to 3.25c
Philadelphia	2.75c to 3.10c
Pittsburgh	2.75c to 3.175c
San Francisco cl.	2.00c
San Francisco lcl.	2.25c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.30c to 2.60c

STRUCTURAL SHAPES

Baltimore	3.10c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Ft. Worth	4.00c
Houston	3.25c
Los Angeles	3.30c
New York†††‡	3.25c to 3.30c
Philadelphia*	2.70c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

PLATES

Baltimore	3.10c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-in. and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Detroit, 3/16-in.	3.30c
Ft. Worth	4.00c
Houston	3.00c
Los Angeles	3.30c
New York‡‡	3.30c
Philadelphia*	2.70c
Phila., 3/16-in.*	2.90c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

NO. 10 BLUE ANNEALED

Baltimore	3.45c
Boston, 3/16-in.	3.915c
Buffalo	3.50c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.25c
Detroit	3.35c
Ft. Worth	4.50c
Houston	3.90c
Los Angeles	4.00c
New York‡‡	3.90c
Portland	3.75c
Philadelphia*†	3.15c
Pittsburgh**	3.20c
San Farncisco	3.80c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.75c
Tulsa	4.20c to 4.34c

NO. 24 BLACK SHEETS

Baltimore	3.25c to 4.00c
Boston	4.85c
Buffalo	4.20c
Chicago	3.80c
Cincinnati	3.90c
Cleveland	3.60c
Detroit	3.95c
Ft. Worth	4.70c
Los Angeles	4.90c
New York	3.90c to 4.00c
Philadelphia*†	4.00c
Pittsburgh**	3.80c
Portland	4.90c
San Francisco	4.90c
Seattle	5.00c
St. Louis	4.10c
St. Paul	3.95c
Tulsa	4.34c

NO. 24 GALVANIZED SHEETS

Baltimore	4.30c to 5.00c
Boston	5.60c
Buffalo	4.70c to 4.85c
Chicago	4.65c
Cincinnati	4.75c
Cleveland	4.45c
Detroit	4.75c
Ft. Worth	5.50c
Houston	5.30c
Los Angeles	5.30c
New York	4.75c
Philadelphia*†	4.75c
Pittsburgh**	4.55c
Portland	5.50c
San Francisco	5.30c
Seattle	5.50c
St. Louis	4.95c
St. Paul	4.90c
Tulsa	5.10c to 5.35c

BANDS

Baltimore	3.85c
Boston	4.015c to 5.00c
Buffalo	3.65c
Chicago	3.20c
Cincinnati	3.90c
Cleveland	3.25c to 3.65c
Detroit, 5/16-in. and lighter	3.30c
Ft. Worth	4.25c
Houston	3.65c
Los Angeles	4.15c
New York‡‡	3.75c
Philadelphia*	3.15c
Pittsburgh	3.25c
Portland	4.00c
San Francisco	3.75c
Seattle	4.00c
St. Paul	3.50c
Tulsa	4.50c to 4.69c

HOOPS

Baltimore (c)	3.35c(a) 3.85c
Boston	5.50c to 6.00c
Buffalo	4.05c
Chicago	3.75c
Cincinnati	4.05c
Cleveland	3.25c to 3.65c
Detroit, No. 14 and lighter	3.80c
New York‡‡	4.25c
Philadelphia*	3.40c
Pittsburgh	4.25c
Seattle	5.00c
St. Paul	4.00c

COLD FINISHED STEEL

	Rounds, hexagons,	Flats, squares
Baltimore (c)	3.35c	3.85c
Boston	3.55c	4.05c
Buffalo	3.95c	4.45c
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.65c	4.15c
Detroit	3.85c	4.35c
Los Angeles (a)	4.50c	.....
New York	3.50c	4.00c
Philadelphia*	3.45c	3.95c
Pittsburgh	3.60c	4.10c
Portland (a)	4.50c	.....
San Fran. (a)	4.25c	.....
Seattle (a)	5.00c	.....
St. Paul (a)	3.85c	.....
Tulsa	4.64c	5.14c

(a) Rounds only.

COLD ROLLED STRIP

Boston, 0.100-inch, 500 pound lots	5.30c
Buffalo	5.85c
Chicago (b)	6.10c
Cincinnati	7.15c
Cleveland (b)	5.95c
Detroit	5.80c
New York	5.15c
Philadelphia (c)	5.00c

(b) Net base, straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.

SWEDISH IRON AND STEEL

New York duty paid	
Hollow drill steel	13.00c
Iron bars, rounds	6.10c
Iron bars, flats and squares	6.50c

*Plus quantity differentials. ‡‡Minus quantity differentials. ††Domestic bars. **25 or more sheets. *†50 or more bundles.

Pacific Coast

Moderate Sales but Bright Prospects for Heavy Demand

SMALL tonnages form most of current sales of steel, both north and south along the coast. Unusual snow is limiting activity at Seattle. A long steel bridge at Tacoma has been approved and will take much steel. Letting of a steel vessel promises return of some shipbuilding work. Prices have been steadied where cutting formerly has been the rule.

San Francisco, Feb. 9.—(*By Air Mail*)—Movement of iron and steel products during the past week was confined to relatively small tonnages. Among the larger lettings were 1000 tons of structural shapes for a sawmill at Alturas, Calif., and 400 tons for an apartment in Los Angeles. The Southern Pacific Co. has an inquiry out for 3500 kegs of track spikes and 1000 kegs of track bolts. This company will shortly come into the market for its 1929 requirements, about 20,000 kegs of track spikes and 5000 kegs of track bolts.

Pig Iron and Coke

Most sales and inquiries for foundry pig iron and coke were confined to small lots for prompt shipment. Foundry operations in the southern part of the state have increased somewhat the past three or four weeks and demand for iron and coke in that district has improved.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	24.00 to 25.00

*C.i.f. duty paid.

The Columbia Steel Corp. took 256 tons of foundry iron for the Puget Sound and Mare Island navy yards. Prices are unchanged.

Bars, Plates and Shapes

Concrete bar awards this week aggregated 925 tons. Among the larger lettings were 350 tons for an apartment on Normandie avenue, Los Angeles. Pending business exceeds 6000 tons, new inquiries involving 190 tons for an apartment on Geary street, San Francisco. Distributors of out-of-stock material in the Los Angeles and San Francisco districts are now quoting 2.20c, base, on carload lots, with 2.60c, base, on less than carload lots.

Plate fabricators are encouraged by the fact that several large inquiries for oil storage tanks have come into the market. Awards this week include 104 tons of 30-inch riveted steel pipe for Glendale, Calif., placed with Lacy Mfg. Co. So far this year 33,641 tons have been booked, compared with 2275 tons for the same period last year. Prices are weak and 2.25c, c.i.f., Coast ports, is being quoted on the usual run of the market, this quotation being shaded somewhat on the larger and more desirable tonnages.

Structural shape awards this week totaled 1286 tons. In addition to 1000 tons for a sawmill at Alturas, Calif., the Moore Drydock Co. booked 150 tons for a school in Sacramento. Long Beach, Calif., is asking for bids on 2000 tons of sheet piling and bids are being taken on 250 tons for a warehouse for the Western Electric Co. at Emeryville, Calif. Plain material remains firm at 2.55c, c.i.f., Coast ports.

Other Finished Material

While a fairly large tonnage of cast iron pipe is pending, awards this week were confined to small lots, with one exception. The Pacific Waterworks Supply Co. took 169 tons for Toledo, Wash. Bids have been opened on 2242 tons for the Southern Pacific Co., San Francisco, on 1103 tons for the East Bay municipal utility district, Oakland, and on 176 tons for Santa Ana, Calif. Among the new inquiries of the week are 338 tons for Anaheim, Calif., and 219 tons for Seattle. Demand for oil country goods and well casing continues well maintained. Distributors of standard steel pipe are specifying more freely but most inquiries are confined to small lots.

Tacoma Bridge Approved

Seattle, Feb. 7.—Buying of steel products in the Pacific Northwest has been retarded by cold weather and snow, several large contracts having been deferred for this reason. However, inquiry is active and considerable tonnage is to be placed in the near future.

Steel prices are holding firm and seem to be well maintained. Little cutting is reported and in the Portland territory, heretofore noted for unstable prices, the market is steadier and prices are being held in line.

Plans of the state highway commission to build steel snowsheds over the pass through the Cascades have been incorporated in a bill before the legislature. Should this project be authorized it will require about 10,000 tons of shapes and plates.

The state has granted permission for a steel bridge from Tacoma across the Narrows, an arm of Puget Sound. Preliminary plans call for four spans. The main span would be 2400 feet and with approaches the structure would be 4944 feet with a clearance of 225 feet above sea level. The estimated cost is $8,000,000 to $10,000,000.

The first steel ship construction work placed with a Puget Sound plant in several years was awarded to the Lake Washington Shipyards where a 168-foot steel motorship to be named W. B. FOSHAY will be built, with cargo capacity for 1000 tons, powered with two Washington-Estep full diesel engines, each of 550 horsepower. Local plants are bidding on a steel fishing vessel which will involve about 250 tons of plates and shapes.

Pig Iron and Coke

There is increased activity among foundries. As a rule local plants are well supplied and little pig iron and coke have been bought recently. Prices are unchanged.

Bars, Plates and Shapes

The market remains firm, mill prices of bars and shapes steady at 2.35c, plates at 2.25c and reinforcing at 2.20c. Awards this week totaled nearly 700 tons in lots of 100 tons or more in addition to a number of smaller contracts. Considerable tonnage is to be released as soon as weather conditions improve.

Local steel mills report unchanged operations. Small tonnages of car lots are less are the rule but several large awards are pending. This week Northwest Steel Rolling Mills booked 175 tons for the Charles apartments, Bellingham.

Jobbing houses are moving a fair tonnage of light gage plates for boiler and tank work. A. M. Castle & Co. booked 200 tons of plates and 200 tons of shapes for the motorship W. B. FOSHAY, under construction at a local yard.

Local fabricating plants are busy with work awarded in recent months and not much new business has been placed.

Jobbing houses report increased buying. Prices are being maintained and the outlook is promising for continued improvement.

Seattle lighting department has purchased 125,000 pounds of copper wire from United States Steel Products Co. for $23,459. The city will open bids this week for construction of a 60,000-gallon asphalt steel storage plant.

Old Materials

The market is unchanged with local mills paying $10 and $11, gross, for steel scrap, receipts being about equal to consumption. Exporters find it difficult to get steamship space for shipment to Japan. Cast iron scrap is strong at $16 to $16.25, gross. There is no surplus of this item.

May Sell Corry, Pa., Plant

Buffalo, Feb. 12.—Negotiations are pending for the sale of the Standard Automatic Products Co.'s plant in Corry, Pa., to a large eastern automobile manufacturer. The company, which employs approximately 400 men, produces screw machine products and other small automotive parts. The negotiations are approaching a final stage, it is reported here.

Foundation Announces a Five-Year Program

Research in alloys of iron said to be the most ambitious undertaking ever attempted in this field, is planned by the Engineering Foundation in cooperation with the American Institute of Mining and Metallurgical Engineers. Industries, universities and technical schools, bureaus of the government, scientific organizations and foreign agencies will aid. The initial task is a critical five-year review of all available literature in English and other languages, resulting in a series of monographs and manuals, at a cost of $150,000.

A committee on alloys of iron research has been appointed. The chairman is John Johnston, director of research and technology, United States Steel Corp. Other members of the committee are: F. M. Becker, president, Union Carbide and Carbon Research Laboratories; H. W. Gillett, chief, division of metallurgy, bureau of standards; James T. MacKenzie, metallurgist and chief chemist, American Cast Iron Pipe Co.; A. J. Wadhams, manager of research and development, International Nickel Co.

The second phase of the program will be research directed toward increasing fundamental knowledge of iron and its combinations with other substances, particularly alloys of pure iron with one or two or three or more other pure metals; also the effects of the impurities incident to practical operations.

Pig Iron Leads Imports

Philadelphia, Feb. 12.—Following are the importations of iron and steel at this port for the week ended Feb. 9: Pig iron: 2500 tons from United Kingdom, 150 tons from British India, 26 tons from Norway; steel scrap: 15 tons from Germany, 12 tons from United Kingdom, 9 tons from France; ferromanganese, 40 tons from United Kingdom; steel rods, 12 tons from Sweden; steel billets, 42 tons from Sweden; steel bars, 147 tons from Sweden, 80 tons from Belgium; strip steel, 9 tons from United Kingdom; structural shapes, 61 tons from Germany, 9 tons from Netherlands.

Scrap Men Meet Feb. 19

Cleveland, Feb. 12.—Scrap iron and steel interests of the Middle West, including dealers of Ohio, Michigan and Indiana, are responding generously to the invitation to a dinner meeting scheduled for the Statler hotel, here, Feb. 19 at 6:30 p. m. The invitations have been sent out by the Institute of Scrap Iron and Steel, 11 West Forty-second street, New York, of which Benjamin Schwartz is director general and Joseph G. Hinter is president. This meeting was originally scheduled for Jan. 22 but was postponed owing to the illness of Mr. Schwarz, who now has fully recovered.

Locomotives Show Loss

Washington, Feb. 12.—January shipments of electric industrial locomotives declined from December, according to the department of commerce. Monthly comparisons follow:

Year and Month	Shipments Total	Shipments Domestic Steam	Shipments Domestic Electric	Unfilled orders Total	Unfilled orders Domestic Steam	Unfilled orders Domestic Electric
1928						
Jan.	47	22	23	222	161	38
Feb.	59	43	11	204	146	40
March	70	44	15	178	123	37
April	46	38	6	188	129	41
May	41	29	10	220	138	39
June	51	39	11	201	109	37
July	46	19	5	198	98	59
Aug.	34	23	4	204	135	26
Sept.	41	28	2	178	118	27
Nov.	35	20	1	152	104	31
Dec.	44	36	4	282	238	27
(1928)	550	367	92	.....	.....	.....
1929						
Jan.	23	6	6	278	251	21

January Stokers Off

Washington, Feb. 12.—Mechanical stoker sales in January dropped somewhat from December, department of commerce statistics show. Monthly comparison follow:

	Stokers sold	Fire tube boilers	Water tube boilers
Total, 1927	1,374	479	895
1928			
January	75	20	55
February	85	26	59
March	123	31	92
April	88	21	67
May	130	43	87
June	162	78	84
July	186	67	119
August	162	57	105
September	161	68	93
October	100	48	52
November	116	54	62
December	102	34	68
Total (year)	1,490	547	943
1929			
January	97	36	61

Metals Lead New England

Boston, Feb. 12.—Measured by the value added by manufacturing processes, the metal trades of New England represent 32 per cent of that territory's production, according to George Hannauer, president of the Boston & Maine railroad. The metal trades in New England thus are greater than all of the textile divisions put together, or the combined rubber, leather and boot and shoe trade of the district.

Lack Semifinished Steel at Valley Mills

Youngstown, O., Feb. 12.—Continued scarcity of semifinished steel supplies, while somewhat restricting finishing mill operations, also is serving to stimulate steel output. However, one active open hearth went down late in the week, making 47 units now active out of a total of 51 independent units. Bessemer operations are unchanged. Steel corporation subsidiary mills in the district are at 80 to 85 per cent.

Independent steel bar operations continue at 70 per cent, and of the Carnegie Steel Co. at 85 per cent. Independent sheetmakers this week have 120 units active out of a total of 127, unchanged from last week. Strip mills are driving at capacity rates as also are independent tin mills, while the Steel corporation tin subsidiary is at 85 per cent. Wrought pipe mill activities show seasonal recession with 11 independent units active out of a total of 20 seamless and welded units. The Byers company puddle and skelp mills at Girard are 80 per cent active.

Electrical Orders Up

Washington, Feb. 12.—An increase in electrical orders was noted in the fourth quarter, figures of the department of commerce show. The total for 1928 exceeded that of 1927. Quarterly comparisons follow:

	1st quarter	2nd quarter	3rd quarter	4th quarter	Total
1923	$220,384,205	$235,571,467	$196,750,860	$210,994,546	$863,701,078
1924	221,687,030	216,637,855	181,160,835	225,070,111	844,555,831
1925	227,767,511	222,056,450	225,184,732	237,225,521	912,234,214
1926	255,917,883	240,855,953	233,873,171	251,442,991	982,089,998
1927	235,883,303	229,353,332	228,610,346	232,877,670	926,724,651
1928	237,508,001	245,520,801	264,466,257	281,988,159	1,029,483,218

List Steel Requirements

The recent hearing of the interstate commerce commission on the complaint of Green Bay, Wis., steel jobbers against freight rates from the Chicago district developed statistics concerning the annual steel consumption of important consumers in Wisconsin. The A. O. Smith Corp., Milwaukee, in 1928 used 285,924 tons and estimated its 1929 needs at 325,000 tons. Representatives of the Allis-Chalmers Mfg. Co. stated they used 7980 tons, Milwaukee Corrugating Co. 40,000 to 50,000 tons, Worden-Allen Co. 17,300 tons, Lakeside Bridge & Steel Co. 11,105 tons, and the Seaman Body Corp. 4970 tons. All these companies are in Milwaukee.

Pittsburgh Screw & Bolt Buys Graham Co.

Pittsburgh, Feb. 12.—The Pittsburgh Screw & Bolt Co., a new organization, has been formed to take over the stocks of the old Pittsburgh Screw & Bolt Corp., the Colona Mfg. Co., Pittsburgh, manufacturer of pipe couplings and fittings, assets of the Graham Bolt & Nut Co., Neville Island, Pa., and patent rights for the manufacture of new types of alloy steel propellor blades and hubs for airplanes. Ownership of the Graham company includes the interest of the Jones & Laughlin Steel Corp.

The executive personnel of the new company largely will be made up of officers of the old Pittsburgh Screw & Bolt Corp. William G. Costin will continue as chairman of the board and Charles R. Ferguson as president. H. C. Graham and C. J. Graham, formerly president and vice president, respectively, of the Graham Bolt & Nut Co., have been elected vice presidents. The following also will be vice presidents: John P. Hoelzel, George H. Lee, Howard L. Keally, John M. Yahres, and Frank B. Gordon. John M. Auty will continue as secretary.

Included on the board of directors will be Henry Lockhart Jr., Taylor Allderdice, Van Lear P. Shriver and John A. Dillon.

Each share of stock of the old Pittsburgh Screw & Bolt Corp. will be exchanged for 3⅜ shares of stock in the new company. Each share of Colona Mfg. Co. will be entitled to 1½ shares of new stock. Combined earnings of the three companies in 1928 are estimated at $2,318,432, or $1.56 a share on the new stock. Current assets as of Dec. 31, 1928, were $18,506,302.

Starts Car Works Soon

Birmingham, Ala., Feb. 12.—The Pullman Car & Mfg. Corp., Chicago, early in March will begin operations in the Fairfield, Ala., car works whose equipment it bought recently from the Tennessee Coal, Iron & Railroad Co. Ground will be broken in March for the new carbuilding plant of the Pullman corporation at Bessemer, Ala.

Chicago Founders Elect

Chicago Foundrymen's club has elected as officers for 1929: President, Dr. H. P. Evans, director of metallurgical research, Pettibone Mulliken Co., Chicago; and vice president, R. E. Kennedy, technical secretary of the American Foundrymen's association. A. N. Wallin, S. Obermayer Co., Chicago, continues as secretary of the club.

The officers were presented at a meeting of the club Feb. 7. Charles J. Scullin, St. Louis, consulting metallurgical engineer and practical foundryman, talked on the operating phases of cupola practice. David G. Anderson, chief of foundry development engineers, Western Electric Co., Chicago, who has served two terms as president, presented a short survey of 1928 activities and predicted another active year for the club.

Again Cut Long Distance Phone Charges

The third reduction in long distance telephone charges in two years, affecting calls between points 130 to 1490 miles apart, became effective Feb. 1 and will result in a saving to users of more than $5,000,000,000 annually, the American Telephone & Telegraph Co. states. From 5 to 25 cents has been cut from charges for station-to-station 3-minute calls within the specified distances. Extra charges for appointment and messenger calls have been eliminated. More than 90 per cent of toll and long distance calls are now handled while the subscriber remains at the telephone, according to Walter S. Gifford, president.

Milwaukee Employment at Record Height

A new alltime record for employment has been reached in Milwaukee industry, with 40,707 at work in the 50 shops regularly reporting for survey purposes, at the beginning of February. This compares with the January record of 38,995. The same shops reported 35,492 at work in February, 1928, while at the same time in 1925 the number was 31,680. Metal trades industries, it is stated, are showing consistent gains in employment. The manufacture of farm implements and power farm machinery for spring selling is at its height, while the same is true of the large group of Milwaukee concerns manufacturing highway and construction equipment.

Will Talk On Stamping

An address on "Sheet Metal and Stamping" by Dr. G. L. Kelly, of the Edward G. Budd Mfg. Co., Philadelphia, will be delivered before the Detroit section of the American Society for Steel Treating, Feb. 18. The meetings of this section have been transferred from the General Motors building to Hotel Fort Shelby.

British Institute Marks 21st Anniversary

The twenty-first annual general meeting of the British Institute of Metals is scheduled to be held in the hall of the Institution of Mechanical Engineers, in London, March 13 and 14, Dr. Walter Rosenhain presiding. The annual dinner will be served March 13. This meeting will celebrate the coming of age of the institute, and with this object a conversazione will be held at the new Science Museum, South Kensington, the evening of March 14, in connection with which a metallurgical exhibition is being arranged.

Membership of the institute reached 2000 for the first time, Dec. 31, 1928. A meeting of the council will be held Feb. 21 to consider applications for membership. The following members who have been nominated for election of the council will be declared duly elected at the annual general meeting: President, Dr. Walter Rosenhain; vice presidents, T. Bolton of T. Bolton & Sons Ltd., London, and Lt. Col. Sir Henry Fowler, chief mechanical engineer, London, Midland & Scottish Railway Co., Derby; members of council, R. Lloyd Gibbins, Birmingham; H. Moore, London; H. A. Ruck-Keene, London; J. Steven, Glasgow; W. G. Turner, Sheffield; H. B. Weeks, London.

Among papers to be submitted are: "Recent Developments in Electric Furnaces," by D. F. Campbell; "An Improved Form of Electric Resistance Furnace," by W. Rosenhain and W. E. Prytherch; and "Special Properties of Eutectics and Eutectoid Alloys in Binary Metallic Systems," by Prof. P. Saldau.

Declares Obsolescence a Tool for Prosperity

Charles F. Abbott, New York, executive director of the American Institute of Steel Construction, was the principal speaker before the Seattle chamber of commerce, Feb. 1. He advocated expansion of a second-hand market as the basis of continued business prosperity. He stated that induced obsolescence is capable of being scientifically promoted and he advocated a careful development of this merchandising principle. "A New Tool for Greater Prosperity" was the speaker's topic, the tool in question being obsolescence. Accompanying Mr. Abbott were W. E. Emmett, district engineer, and Lee H. Miller, chief engineer, of the institute.

Industrial Men in the Day's News

Jesse F. Welborn, Chairman of the Board, Colorado Fuel & Iron Co., Denver

BORN in Nebraska and affiliated with a Colorado company all his business career, he is essentially a western man.

THIRTY-EIGHT years of loyal devoted service prove him to be a one-company man. He has survived several different regimes.

CLERK, assistant secretary, assistant treasurer, general agent at New York, general sales agent at Denver, vice president and general sales manager, president and now chairman, record the progress of this one-time farmer boy.

WESTERN born and western reared, Jesse F. Welborn, elected chairman of the board of the Colorado Fuel & Iron Co., Denver and Pueblo, Colo., as noted in IRON TRADE REVIEW of Jan. 31, virtually has spent his entire life in the West. Periodic visits he has made in the East during his regime as president and while holding other executive positions in this important steelmaking interest, but excepting several months in 1899, when he was general agent in New York for the Colorado company, his duties have kept him steadily occupied in the Rocky Mountain side of the Mississippi river. Advancement to the highest position attainable in the official personnel of the Colorado company comes as a suitable recognition of the many years of loyal and effective service Mr. Welborn has rendered.

Except for a clerkship and a brief term as cashier in the bank of the eastern Nebraskan town near which he was born, Mr. Welborn has been a one-company man. All of the more than 38 years since August, 1890, when he started his real industrial career, have been spent with the Colorado company. He entered its service at Denver that year, at the time the company was known as the Colorado Coal & Iron Co. It operated several blast furnaces and a few mills at Pueblo making wire nails, steel rails, muck bars, etc. Its main office was in New York and Edward J. Berwind was president, E. M. Steck acting general manager, and George W. Cook general sales agent in Denver. Two years later the company was incorporated under Colorado laws and the present style—the Colorado Fuel & Iron Co. was adopted.

Mr. Welborn's ability was generally recognized and as the company progressed he kept pace with it. He was made assistant secretary and then assistant treasurer and in 1899, after a brief sojourn in the New York office, he became general sales agent at Denver, serving until 1903. Early in the 1900's a new regime was inaugurated: John C. Osgood, of Redstone, Colo., was chairman and J. A. Kebler was president. A number of distinguished names were on the directorate, including John J. Mitchell, Chicago banker, and John W. Gates, pioneer in the wire industry and later a spectacular figure in the stock market. In 1903 Mr. Welborn was elected vice president and general sales manager. One year later, the financially powerful family of Jay Gould summoned a new president to succeed Mr. Kebler, namely Frank J. Hearne, former president of the National Tube Co. After Mr. Hearne's unexpected death in February, 1907, Mr. Welborn became his successor, formally taking office March 25, 1907.

Occupying the president's chair continuously for more than 21 years, Mr. Welborn has seen the West grow industrially and commercially and has witnessed his own company expanding, and growing more powerful. Its control some time ago passed to the Rockefeller family. While the company originally used local iron ores and coal, its demands expanded until it became necessary to obtain better ores from mines in Wyoming and New Mexico. Important coal properties were developed in Colorado and this led to heavy distribution of its fuel

throughout Denver and other cities in Colorado. Its line of steel products has been constantly enlarged and in spite of difficulties, superinduced by intermountain transportation and traffic freight rate structure complexities, its trade has steadily broadened. That this largely has been achieved under the direction and guidance of Mr. Welborn is almost universally conceded.

Mr. Welborn is a member of the American Iron and Steel institute, as well as other technical organizations, clubs, etc., but his chief interest always has been and doubtless will be for many years, the policies of the Colorado Fuel & Iron Co.

Men of the Industry

GUSTAVE KAHN, vice president in charge of sales of the Truscon Steel Co., Youngstown, O., has retired from active business, effective March 1. Mr. Kahn joined the Truscon company three months after it had been organized by his two brothers, Julius and Albert Kahn, and has been connected with it continuously for the past 25 years. He always has been identified with the sales end of the organization. His associates in the company will tender Mr. Kahn an informal dinner party at Wickliffe Manor, Feb. 16. He leaves for a world cruise soon.

* * *

E. H. Frederick, who for a number of years has been connected with the Bonney-Floyd Co., Columbus, O., now is identified with the sales department of the Farrell-Cheek Steel Foundry Co., Sandusky, O.

* * *

C. H. Stewart, formerly New England sales manager for the Pittsburgh Steel Co., Pittsburgh, has been named assistant manager of the New York district office. He has been succeeded in his former position by J. W. Janes.

* * *

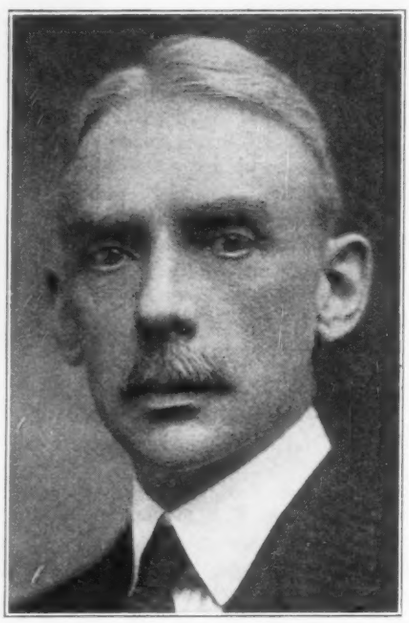
James Thompson, chief engineer, Hubbard Steel Foundry Co. East Chicago, Ind., and chairman of the mayor's sanitation committee, that city, has also been appointed chief engineer for the newly created East Chicago sanitary district.

* * *

E. E. Boon, formerly with the Westinghouse Electric & Mfg. Co., has been appointed sales manager of the Westinghouse-Nuttall Co., Pittsburgh, to succeed J. E. Mullen. Mr. Mullen now is with the National Foundry Co., Erie, Pa., manufacturer of steel castings and gears.

* * *

Charles O. Hadly, who as noted on page 422 of IRON TRADE REVIEW last week, resigned as vice president in charge of sales of the Alan Wood Iron & Steel Co., Philadelphia, has played a prominent part in the development of many sheet-consuming lines and also in promoting classification work. He was born in Allegheny, now Northside, Pittsburgh, and his initial employment was an office boy for W. D. Wood & Co., Pittsburgh. When that company became known as the W. Dewes-Wood Co., McKeesport, Pa., Mr. Hadly became purchasing agent. He later rose to prominence in the Wood companies



CHARLES O. HADLY

sales organization and when the latter were acquired by the organizers of the American Sheet Steel Co., he was stationed at New York, in charge of sales of products made at the Wood plants. In 1905 he became affiliated with the Alan Wood Iron & Steel Co., where he since has remained. During the war Mr. Hadly was a member of the American Iron and Steel institute's subcommittee on sheet steel.

* * *

Thomas H. House, formerly sales manager of the Republic Motor Truck Co., Alma, Mich., has been named to succeed the late Oliver Hays in charge of all operations of the company, that city. He will act as assistant to G. L. Hanks, chairman of the executive committee.

* * *

John C. Spence, formerly works manager of the machine division of the Norton Co., Worcester, Mass., grinding machine manufacturer, has purchased an interest in the Universal Boring Machine Co., Hudson, Mass. He has been appointed works manager of the latter company.

* * *

O. B. Wilson has been placed in charge of the Cleveland office, 819 Hippodrome building, of the Brown Instrument Co., Philadelphia, manufacturers of pyrometers, theormometers, etc. Mr. Wilson has been with the Brown organization for more than five years, in the home office as well as New York territory.

* * *

W. H. Brand, vice president of the First Wisconsin Co., Milwaukee, has been elected a director of the Interstate Drop Forge Co., Milwaukee. This company, which recently increased its output 40 per cent by plant and equipment additions, is a part of an affiliated group comprising the Chain Belt Co., Federal Malleable Co., Sivyer Steel Casting Co., all of Milwaukee. C. E. Stone is president, Lamar S. Peregoy vice president and C. C. Bremer secretary and treasurer. Directors include Edgar L. Wood, W. C. Frye, C. R. Messinger, W. J. Nugent and Clifford F. Messinger in addition to Messrs. Brand, Stone and Peregoy.

* * *

John H. Warne, who as noted on page 304, IRON TRADE REVIEW, Jan. 24, purchased the Standard Boiler & Plate Iron Co., Niles, O., has been elected president and treasurer, to succeed D. J. Finney, who remains on the board of directors. Mr. Warne formerly was vice president and general manager of the William B. Pollock Co., Youngstown, O. Edgar J. Reilly, formerly director, in charge of sales for the latter company, becomes vice president and secretary. Miss May Sweeney is assistant secretary and assistant treasurer.

* * *

C. W. Yerger, eastern district manager of the Cutler-Hammer Mfg. Co., Milwaukee, for some time, will become sales manager of the Hanson-Van

(*Continued on Page* 504)

Improvement in British Trade

Increase in Bank Rate, However, Tending to Retard Business—Steelworks Busy—German Export Orders Larger—Belgian and French Markets Active and Firm—Iron and Steel Output in Great Britain Shows Gain for January

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, Feb. 12.—(By Radio)—British trade is stronger, but an increase in the bank rate is tending to check business. Pig iron demand is better.

Hematite is firm. Shipments are being made to France, Germany, Belgium and the United States. Additional blast furnaces are being started. Steelworks are busy but new orders are scarce. The markets in Scotland continue unsatisfactory, while in the north of England the steel trade is active, with shipbuilding orders predominating. Galvanized sheets are firm. Sales are noted to Australia and New Zealand. Tin plate demand is fair.

A report from Berlin states German export business is expanding, while domestic markets are quiet. Brussels reports iron and steel markets firm. A sale of 1000 tons of sheet bars was made at £5 3s ($24.97) f.o.b., Antwerp. Other semifinished steel is scarce. Wire rods have been sold to Japan at £7 18s 6d ($38.42) c.i.f., Kobe. The markets in France are active. Steelmakers are soliciting business in central Europe.

Production of pig iron in Great Britain in January amounted to 550,000 tons, compared with 540,400 tons in December and 544,000 tons in November. The number of active stacks was increased by six, with 138 in blast at the close of January. Steel ingot output in January totaled 750,000 tons, against 683,100 tons in December and 762,500 tons in November. Exports of pig iron from Middlesbrough in January are estimated at 10,613 tons, compared with 9333 tons in December.

Shipbuilding Activity Aids British Steel

BIRMINGHAM, Eng., Jan. 25.—One sign of improvement in British industry is the steady flow of work coming to the shipyards of Teesside. One firm has 29 vessels on order, including six grain steamers for the Canadian lakes. Another concern has an order from British owners for three 10,000-ton vessels. This movement has already had its effect upon mills rolling plates and sections, although a good deal of the steel needed for the shipping contracts has yet to be placed. The steelworks in their turn are drawing larger supplies from pig iron makers and most of the output in that district is going into consumption, leaving a relatively small tonnage for sale to outsiders. The structural trade in the north of England is taking more steel, but in the Midlands demand has been only moderate for some weeks. The steel association has confirmed prices of joists and angles at £7 17s 6d ($38.18) and ship plates at £8 12s 6d ($41.82). Rail mills at Barrow are steadily employed with assurance of work for some time. There has been a lull in heavy contracts for rolling stock and home railway business is exceptionally quiet.

Sterling $4.85

In many lines continental competition is negligible. Exporting houses are not keen for business with Midland merchants. Such lines as bright drawn steel from Germany are off the market while the difficulty of obtaining strip has brought some business to English houses from consumers who have been relying on foreign material for some time. It is stated by merchants handling strip that it takes

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Feb. 11	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable								
PIG IRON		£ s d		£ s d		£ s d		£ s d
Foundry No. 3, Silicon 2.50-3.00	$16.01	3 6 0*	$16.49	3 8 0	$16.49	3 8 0	$16.01	3 6 0
Basic	15.76	3 5 0	16.01	3 6 0	16.01	3 6 0	15.28	3 3 0
Basic-bessemer	17.22	3 11 0†	16.01	3 6 0	16.01	3 6 0	14.55	3 0 0
Hematite, Phosphorus 0.02-0.05	17.22	3 11 0	23.07	590*	.....	.....	16.98	3 10 0
SEMIFINISHED STEEL								
Billets	$30.92	6 7 6	$24.98	5 3 0	$24.98	5 3 0	$24.25	5 0 0
Wire rods	41.83	8 12 6	30.31	6 5 0	30.31	6 5 0	30.31	6 5 0
FINISHED STEEL								
Standard rails	$37.59	7 15 0	$31.53	6 10 0	$31.53	6 10 0	$31.53	6 10 0
Merchant bars	1.68c	7 15 0	1.36c	6 4 0	1.36c	6 4 0	1.36c	6 4 0
Structural shapes	1.60c	7 7 6	1.11c	5 1 0	1.11c	5 1 0	1.12c	5 2 0
Plates, ship, bridge and tank	1.76c	8 2 6	1.39c	6 6 0	1.39c	6 6 0	1.38c	6 5 0
Sheets, black, 24 gage	2.17c	10 0 0	2.28c	10 7 6	2.28c	10 7 6	2.50c	11 7 0
Sheets, galvanized, 24 gage, corrugated	2.96c	13 12 6	3.01c	13 13 9	3.01c	13 13 9	3.43c	15 12 0
Bands and strips	2.17c	10 0 0	1.40c	6 7 6	1.40c	6 7 6	1.49c	6 15 0
Plain wire, base	2.12c	9 15 0	1.71c	7 15 0	1.71c	7 15 0	1.65c	7 10 0
Galvanized wire, base	2.93c	13 10 0	2.17c	9 17 6	2.17c	9 17 6	2.20c	10 0 0
Wire nails, base	2.39c	11 0 0	1.80c	8 3 9	1.80c	8 3 9	1.87c	8 10 0
Tin plate, base box 108 pounds	$ 4.37	0 18 0	.....	.....	.....	....	$ 6.79	1 8 0

*France

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks	
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$16.01	3 6 0	$17.59	450(2)	$16.68	600	$18.51	78
Basic pig iron	15.76	3 5 0	18.96	485(1)	16.96	610	20.88	88
Furnace coke	3.52	0 14 6	5.87	150	5.14	185	5.11	21.50
Billets	30.31	6 5 0	23.07	590	24.60	885	28.71	121
Standard rails	1.79c	8 5 0	1.46c	810	1.63c	1,250	1.51c	140
Merchant bars	1.68c	7 15 0	1.33c	740	1.42c	1,095	1.52c	141
Shapes	1.71c	7 17 6	1.26c	700	1.22c	940	1.49c	138
Plates, ship, bridge and tank	1.87c	8 12 6‡	1.54c	855	1.46c	1,125	1.71c	158
Sheets, black, 24 gage	2.28c	10 10 0	2.92c	1,620	2.34c	1,800	2.43c	225
Sheets, galvanized 24 gage, corrugated	2.96c	13 12 6	3.69c	2,050	3.84c	2,950	3.78c	350
Plain wire	2.12c	9 15 0	1.94c	1,075	2.08c	1,600	2.48c	230
Bands and Strips	2.17c	10 0 0	1.51c	840	1.72c	1,325	1.72c	165

*Middlesbrough; †Scotch foundry iron; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 14s 6d ($3.52) f. o. b. Ferromanganese £21 13s 0d ($105.00) delivered Atlantic seaboard, duty-paid. German ferromanganese £15 0s 0d ($72.90) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semifinished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

three months to get delivery. Consumers here are accustomed to carry two months' stocks but are not disposed to place orders abroad in view of this delay and the small difference between English and foreign prices. English billets can be bought at £6 5s ($30.31) and Continental billets £6 2s 6d ($29.70), but there is no great demand for either. Users of No. 3 Belgian iron bars now have to pay £7 5s ($35.16), delivered here, and in doing so are able to save about £1 10s ($7.28) as compared with Staffordshire iron, although twelve months ago they could have bought the same material from Belgium for £6 ($29.10) a ton.

There was a surprise move on the Birmingham exchange yesterday in the shape of concerted action by Midland smelters of pig iron. Furnaces have had absolute freedom in quoting prices, and even now there has been no attempt at control, but a number of representatives held a meeting, presumably to consider the position of the trade, with the result that an official announcement was made indicating an advance of 2s 6d ($.60) in Midland irons. It is denied that any organization has been formed, but it is understood the meeting dissolved with an understanding that it would be called together again, efforts being made in the meantime to place the movement on a fully representative basis. This announcement came after business had been done for the day on the basis of £3 1s ($14.79) for Derbyshire foundry and £2 15s ($13.33) for Northampton.

The hematite trade shows steady improvement. On the west coast stocks have been reduced, and there is every prospect of relighting furnaces soon. North east coast hematite is also in good demand and prices are firm at £3 11s ($17.21) for mixed numbers. While export trade for Middlesbrough pig iron is not expanding in new bookings, actual shipments this month are already 1000 tons ahead of the corresponding period in December.

The Midland district is responsible for most motor car and motorcycle output of Britain, and these industries are absorbing quantities of special steel such as thin strip.

The galvanized sheet trade is one of the busiest sections. Prices are strong at £13 12s 6d ($66.06) to £13 15s ($66.67) and the works can get as much business as they like at this figure. The black plate trade is also showing improvement.

The meeting of the tin plate makers at Swansea resulted in confirmation of 18s ($4.37) as the minimum per base box. Current business is being taken generally at this figure and makers quoting 18s 3d ($4.43) have difficulty in obtaining business. The trade has deemed it prudent to continue the output restriction scheme and works accordingly will close down for two weeks during the period Feb. 24 to May 25. Official figures of output in Wales during 1928 gives the total of tin, terne and black plates as 865,000 tons. The exports were 562,529 tons.

Belgian Trade a Record

Brussels, Jan. 21.—(*European Staff Service*)—For the third month in succession imports of pig iron into Belgium and Luxemburg in October reached a record figure. Imports of rolled steel products in October, including scrap, also exceeded previous figures. The principal items imported were: Semifinished and merchant steel, 15,367 tons, and scrap, 19,133 tons.

The principal items exported in October were: Plates and sheets, 65,302 tons; structural steel, 61,428 tons; semifinished and merchant steel, 46,720 tons; wire, 39,749 tons; rails, 22,564 tons; hoops, 15,575 tons.

Figures are as follows:

	IMPORTS		EXPORTS	
Mon. ave.	Pig iron	Steel	Pig iron	Steel
1925	27,095	15,860	8,060	242,325
1926	27,505	27,265	13,105	304,075
1927	31,760	27,715	11,350	387,415
1928				
Jan.	37,625	34,357	6,793	289,854
Feb.	40,293	37,481	7,952	401,502
March	43,612	31,294	11,971	458,377
April	36,769	29,203	9,583	325,728
May	36,506	31,971	15,317	338,052
June	44,314	33,793	7,484	382,700
July	42,305	35,409	7,367	344,977
August	45,589	39,329	7,716	294,781
Sept.	52,784	39,233	5,189	321,731
Oct.	55,173	45,481	6,259	432,131

French Make Much Coke

Paris, Jan. 14.—(*European Staff Service*)—Production of coke at French coal mines during November was almost equal to the highest figure reached in October. November imports included 299,199 tons from Germany, 64,484 tons from Belgium, 54,850 tons from Holland; the balance came from Great Britain and other countries. Exports of coke went principally to Italy, Switzerland, Belgium and Luxemburg, Spain, and other countries.

Comparisons are as follows:

Mon. ave.	Production	Imports	Exports
1913	335,620	255,835	17,085
1925	255,410	416,880	39,440
1926	313,950	462,915	39,320
1927	339,015	395,580	33,430
1928			
Jan.	357,475	473,018	25,840
Feb.	343,186	411,455	23,119
Mar.	369,360	445,656	15,324
Apr.	360,446	482,575	22,689
May	367,725	526,593	12,366
June	360,141	489,144	30,507
July.....	370,259	427,291	42,342
Aug.	363,579	445,299	47,243
Sept.	354,411	425,073	44,240
Oct.	386,229	405,889	45,183
Nov.	379,701	418,585	57,505

German Trade Well Held

Berlin, Jan. 14.—(*European Staff Service*)—Notwithstanding the fact that 65 per cent of the blast furnaces and steelworks of Germany were closed during November, exports of steel amounted to 377,557 metric tons, as against 382,065 tons in October, including scrap. Principal exports were 85,200 tons of bars, shapes, hoops and bands, 38,962 tons of plates and sheets, 33,583 tons of wire rod and wire, 27,076 tons of railroad track material, 23,812 tons of forged tubes, 21,583 tons of semifinished steel, 16,801 tons of castings and 12,851 tons of forgings. The tonnage of scrap exported in November was 37,578 metric tons. During the month exports of pig iron and ferroalloys were 32,614 metric tons, compared with 33,625 tons in October. November exports of pig iron and ferroalloys were the second largest tonnage of the year.

Imports were mainly composed of 55,144 tons of bars, shapes, hoops and bands, and 17,057 tons of semifinished

Belgian Trade Ententes Growing; Steel Market Firm and Profitable

BRUSSELS, Jan. 25.—(*European Staff Service*)—The Belgian iron and steel market remains firm, but no further important advances in prices have been registered. The present level, however, is considered high enough. During the past week new business has receded from the high degree of activity which had been noted early in the year. A strike of the dockers at Antwerp, which lasted only a few days, has resulted in an increase in the cost of handling material at the docks and loading on vessels. The situation in the coal industry shows signs of improvement since the formation of the syndicate, and it is expected that a rise in prices soon will be decided upon.

A Belgian pig iron comptoir now is constituted and will function as from March 1. The Franco-Belgo-Luxemburg entente for the export of phosphorus pig iron has provisionally maintained its present constitution, but it is expected that it eventually will be transformed into a regular syndicate. The volume of business for semifinished steel has been small. The Germans are reported to have offered tonnages of blooms. Sheet bars have been sold by the Cockerill company at £5 2s ($24.75). Six-inch blooms are quoted at £4 13s ($22.55). Two-inch billets range from £5 1s to £5 2s ($24.45 to $24.75). The structural steel market is firm and beams have been quoted at £5 2s 6d ($24.90), British sizes being quoted at £5 5s ($25.50). Merchant bars have attained £6 4s ($30), but business is transacted at anything between £6 3s ($29.80) and the latter price. Certain exporters are taking speculative orders when they can obtain £6 3s. Firm orders have been taken at this price, but certain mills refuse to include in these specifications those sizes for which they already are heavily booked. Three-millimeter sheets remain at £6 11s 6d ($31.85).

There have been rumors that the wire rod syndicate will be broken up June 30, which is the present date of expiration. It will be recalled that the syndicate was formed on the assumption that before its expiration a syndicate would also be organized among the producers of wire products. However, it is generally expected that the wire rod syndicate will be renewed, and in the meantime it is reported that negotiations for the formation of the wire products comptoir are progressing. In any case, whatever difficulties may exist in the midst of the wire rod syndicate are of a technical nature and have no bearing on the actual principles adopted by the syndicate.

products. The tonnage of scrap imported was 15,520 metric tons.

The following table gives comparisons:

	IMPORTS		EXPORTS	
Mon. ave.	Pig iron	Other iron and steel	Pig iron	Other iron and steel
1925	17,190	103,525	18,540	277,190
1926	9,230	95,890	42,730	402,905
1927	23,895	217,505	29,910	347,645
1928				
Jan.	27,493	234,899	13,879	349,147
Feb.	23,086	217,238	21,579	369,197
March	19,068	229,267	26,488	408,310
April	27,118	219,298	19,583	393,227
May	26,742	159,708	18,445	380,025
June	31,422	145,783	20,628	432,603
July	29,765	153,005	23,557	442,528
August	35,994	160,069	30,320	475,537
Sept.	26,443	150,068	30,301	450,346
Oct.	27,909	137,124	33,625	382,065
Nov.	18,492	124,109	32,614	377,557

Holland Company Plans Third Furnace

A third blast furnace, typical of American layout, unit construction and equipment is to be built at the plant of the Koninklijke Nederlandsche Hoogovens en Staalfabrieken, located in Ymuiden, Holland, according to an announcement in a recent issue of *Freyn Design*. The design of the new stack will be similar to the two built in 1922 and will be prepared by the Freyn Engineering Co., Chicago. Details involved in the electrification of the rail steel rerolling mill of the Pollak Steel Co., Marion, O., also are presented in a 4-page article in *Freyn Design*, as well as engineering features of open hearth, blast furnace, boiler and power house installations engineered by the Freyn company.

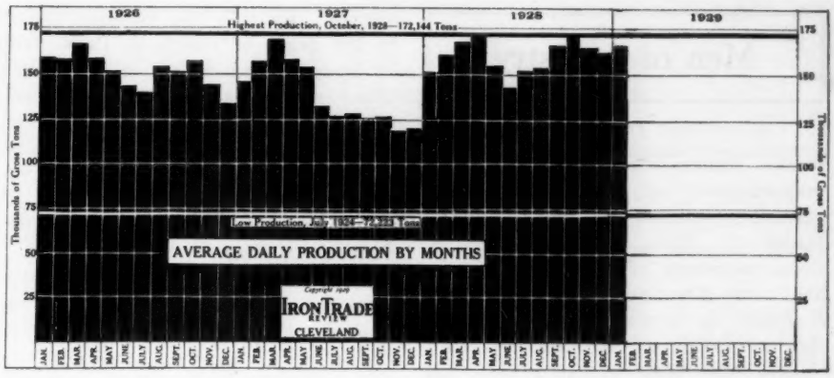
Ask Forced Arbitration

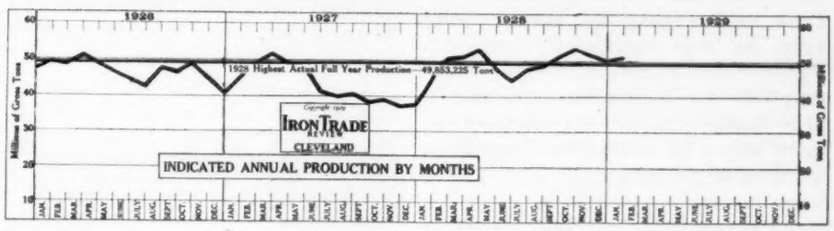
Compulsory arbitration of disputes within the scrap iron industry has been approved by the southern New England chapter of the Institute of Scrap Iron and Steel Inc., Hartford, Conn. A resolution was adopted, recommending to the annual meeting of the institute the amendment of the institute by-laws, making arbitration compulsory instead of voluntary, as is the situation at present.

Harry Ehrlich, Springfield, Mass., was appointed a representative to the New England shippers advisory board of the American Railway association.

Buying Farm Machinery

Toronto, Ont., Feb. 12.—Demand for modern farm machinery in the Canadian West, according to a recent survey, exceeds the supply. In 1928 farm tractor sales increased 71 per cent over 1927 and 67 per cent over the previous high record of 1920. Sales of harvester-threshers, or "combines" increased 61 per cent over 1927.





January Ingot Record Is Set

OPEN-HEARTH and bessemer steel ingot production last month was greater than in any January in history. The daily rate of 166,274 gross tons, as computed by the American Iron and Steel institute, surpassed by 5 per cent the previous record of 158,931 tons in January, 1926. By about 4 per cent it exceeded the 160,777 tons of December and by a wide margin the 153,513 tons of January, 1928.

January's total ingot output was 4,489,391 tons, contrasted with 4,019,432 tons in December and 3,991,332 tons in January one year ago. In only two months of 1928 was a greater tonnage of ingots made. The January daily rate was topped only three times last year. Were the January rate to be maintained, 1929 would be a 50,500,000-ton year, contrasted with the 1928 record of 49,857,223 tons.

On the basis of capacity of 58,627,910 gross tons, January operations were at the rate of 88.20 per cent, compared with 85.29 per cent in December, 81.43 per cent last January and an average of 85.04 per cent for all 1928. In the accompanying table are shown comparisons, as compiled by the American Iron and Steel institute.

Sales agents of the Lorain Steel Co., Johnstown, Pa., in the territory east of the Rocky mountain held their annual 2-day conference at Johnstown, Jan. 28-29.

Steel Ingot Production—1928-1929

94.68 Per Cent of Industry Reporting

Gross Tons

1928	Open-hearth	Bessemer	Monthly output companies reporting	*Calculated monthly output all companies	Number of working days	Approximate daily output all companies	Per cent of operation
Jan.	3,280,247	498,746	3,778,993	3,991,332	26	153,513	81.43
Feb.	3,308,728	521,366	3,830,094	4,045,304	25	161,812	85.84
March	3,700,411	567,309	4,267,720	4,507,520	27	166,945	88.56
April	3,509,637	564,039	4,073,676	4,302,573	25	172,103	91.29
May	3,397,631	581,949	3,979,580	4,203,190	27	155,674	82.58
June	3,016,487	527,351	3,543,838	3,742,964	26	143,960	76.37
July	3,075,247	533,550	3,608,797	3,811,573	25	152,463	80.88
Aug.	3,386,750	569,436	3,956,186	4,178,481	27	154,759	82.09
Sept.	3,381,917	545,015	3,926,932	4,147,583	25	165,903	88.01
Oct.	3,802,396	598,227	4,400,623	4,647,891	27	172,144	91.32
Nov.	3,441,985	590,796	4,032,781	4,259,380	26	163,822	86.90
Dec.	3,308,872*	496,726*	3,805,598*	4,019,432*	25	160,777*	85.29*
Total	40,610,308*	6,594,510*	47,204,818*	49,857,223*	311	160,313*	85.04*
*Revised							
1929							
Jan.	3,700,939	549,616	4,250,555	4,489,391	27	166,274	88.20

Figures exclude crucible and electric ingots. Operation percentages for 1928 and 1929 are based on an annual open-hearth and bessemer steel ingot capacity of 58,627,910 tons as of Dec. 31, 1927.

Men of Industry

(*Continued from Page* 500)

Winkle-Munning Co., Matawan, N. J., manufacturer of electroplating and polishing equipment and supplies, March 4. This will permit E. N. Boice, secretary of the company, who has been directing the sales of the company, to devote his entire attention to his duties as secretary. Mr. Yerger has been affiliated with the Cutler-Hammer company since 1903. Prior to becoming its eastern manager, he was successively engineer, Pacific coast representative and manager of the Cincinnati, Washington and Boston offices. In addition he spent about 18 months in England in his company's behalf.

* * *

W. H. Carstens, Seattle, president of the Majestic Furnace & Mfg. Co., Seattle, has been elected president of the Northwest Furnace Builders' association.

* * *

J. E. Ferguson, manager of the Euclid, O., branch of the Austin Co., Cleveland, was elected president of the Euclid chamber of commerce.

* * *

T. K. Mousdale and F. Grinshaw Martin have been appointed secretary and technical director respectively of the British Perlit Iron Co., Liverpool, Eng.

* * *

George P. Pilling, vice president, Pilling & Co. Inc., Franklin Trust building, Philadelphia, has returned from a month's trip to Europe.

* * *

John A. Smeeton has resigned as managing director of the British Perlit Iron Co. Ltd., Liverpool, Eng. He will remain identified with the company as a director.

* * *

E. F. Baker, president of the Kewanee Boiler Co., Kewanee, Ill., has been elected a director of the American Radiator Co., New York, to fill the unexpired term of E. E. Baker, deceased.

* * *

William W. Brierly, president, Millbury Steel Foundry, Millbury, Mass., was re-elected president of the Employers' Association of Central Massachusetts at its recent annual meeting.

* * *

Clifton A. Crocker was elected president of the National Equipment Co., Springfield, Mass., at the recent annual meeting of the board of directors. He fills the vacancy caused by the death of Frank H. Page. John J. Duggan was added to the board. Other officers are: A. L. Bausman, vice president; George A. Bausman, treasurer; William C. Overman, assistant treasurer, and George S. Sabin, clerk. Directors also include R. F. McElwain, Emerson Gaylord, William S. Kies and Kenneth B. Page.

* * *

Charles Edison, son of Thomas A. Edison and president of Thomas A. Edison Inc., East Orange, N. J., has been elected president of the Splitdorf-Bethlehem Electrical Co., Newark, N. J.

* * *

J. J. Hasburgh has been appointed manager of sales of the reinforcing bar division of the Sheffield Steel Corp., Kansas City, Mo. Lester G. Schraub has been made manager of sales of the wire division.

* * *

Scott Scammell, Trenton, N. J., and Edward W. G. Borer, Philadelphia, have been added to the board of directors of the Erie Malleable Iron Co., Erie, Pa. They will represent the John A. Roebling's Sons Co., Trenton.

* * *

H. D. Wilkinson, formerly on the western circulation sales force of IRON TRADE REVIEW, now represents the Liquid Metal Products Co., 231 South La Salle street, Chicago, producer and distributor of a rust and corrosive resisting coating for zinc and aluminum products.

* * *

Arnold Hackstaff was appointed sales agent at Denver for the Youngstown Sheet & Tube Co., Youngstown, O., succeeding late last fall Forrest Rutherford, who resigned. The latter has become identified with the Republic Iron & Steel Co., Youngstown, in sales capacity as noted on page 361 of IRON TRADE REVIEW of Jan. 31.

* * *

Harry R. Howell, formerly foundry superintendent, Superior Foundry Co., Cleveland, has become affiliated with the Paxton-Mitchell Co., Omaha, Nebr., in a similar capacity. Prior to his association with the Superior Foundry Co. he was foundry superintendent of the Ryan-Bohn Foundry, Lansing, Mich.

* * *

George F. Fuller, president of the Wyman & Gordon Co., Worcester, Mass., was re-elected a trustee of the Worcester Polytechnical institute, at the annual meeting of the Alumni council, Feb. 2. New trustees include Harry P. Davis, '90, vice president of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and Harrison P. Eddy, '91, consulting engineer, Boston.

W. A. Murphy, purchasing agent of the Weirton Steel Corp., Weirton, W. Va., has been elected assistant secretary. E. H. Kern, assistant purchasing agent, succeeds Mr. Murphy.

* * *

* * *

H. L. Sanders has been elected president of the Cincinnati Car Corp., Cincinnati, which recently was formed to take over the manufacturing properties of the Cincinnati Car Co., and the Versare Corp., Albany, N. Y. Other officers of the company are: A. L. Kasemeier, J. H. Elliott and O. F. Warhaus, vice presidents; E. C. Bernhold, secretary-treasurer, and S. E. Reiph, assistant secretary-treasurer.

* * *

Herbert H. Dewey has been appointed vice president of the International General Electric Co. Inc., Schenectady, N. Y., with supervision of all interests of the company in connection with its Russian business. As assistant engineer of the central station department of the General Electric Co., Mr. Dewey was called upon to go to Russia, first in 1927 and again in 1928. He has been with the General Electric Co. for 22 years, and since 1912 has had a part in practically every large high power transmission project in which his company became interested.

* * *

Robert W. Gillispie, vice president and general manager of the Jeffrey Mfg. Co., Columbus, O., since October, 1927, has been named president and general manager of the Galion Iron Works & Mfg. Co., Galion, O., which recently was acquired by the Jeffrey company. Other officers of the Galion company are: Chairman of the board, D. C. Boyd; vice president, J. S. Boyd; and secretary-treasurer, F. W. Faber. Mr. Gilliespie was for many years identified with the Bethlehem Steel Co., Bethlehem, Pa., and before locating in Columbus in July, 1926, was assistant manager of structural and plate sales.

* * *

H. G. Semple, connected with the Pittsburgh district sales office of the Jones & Laughlin Steel Corp., on Feb. 10 celebrated the 50th anniversary of his affiliation with that company. Mr. Semple's service with Jones & Laughlin dates back to Feb. 10, 1879, when he entered the organization as office boy. A few years later he assumed clerical duties, serving successively in the invoice, shipping and

pricing departments. In 1900 he entered into sales work in the Pittsburgh district of the company and has continued in that capacity since that time. This district includes western Pennsylvania, eastern Ohio and West Virginia.

* * *

A. H. Jameson, sales manager, Deemer Steel Casting Co., New Castle, Del., has resigned, effective March 15, to become manager of casting sales for the Malleable Iron Fittings Co., Branford, Conn.

* * *

W. A. Kramer, son of President A. A. Kramer, Columbian Steel Tank Co., Kansas City, Mo., has been appointed director of purchases. He succeeds J. L. Merl, who resigned as purchasing agent, as noted in IRON TRADE REVIEW Jan. 31.

* * *

F. W. Gane has resigned as representative of the Blackhawk Mfg. Co., Milwaukee, manufacturer of socket wrenches and hydraulic jacks, in Michigan, eastern Ohio, northern West Virginia and western Pennsylvania. This territory will be covered by George Wilkinson and L. K. Cobb, who recently was promoted from junior representative to district manager.

* * *

Arthur W. Steed has been appointed superintendent of the maintenance department of the Middletown, O., plant of the American Rolling Mill Co. Mr. Steed became identified with the company Dec. 17, 1915, as assistant superintendent of the power house. He was made superintendent of the power house in January, 1924. He later was appointed combustion engineer, which position he held until his recent promotion. He is a member of the Association of Iron and Steel Electrical Engineers.

Canadian Tariff Changes Seen Unlikely

Toronto, Ont., Feb. 12.—The speech from the throne delivered at the opening of the Canadian parliament Feb. 7 omitting all reference to the tariff in an outline of the legislative program, it is not expected that any important changes in the tariff will be made at this session. At recent hearings, to consider proposals of iron and steel producers for increases, consumers made strong objections to any revision upward. The lineup of the present government makes it improbable that the government will alienate its strong western support, which is opposed to any increase.

Obituaries

WALTER C. RUNYON, 71, formerly president of the Struthers Furnace Co., Struthers, O., died Feb. 6 at Scarsdale, N. Y. In about 1894 Mr. Runyon became a partner of Jabez Stubbs, forming Runyon, Stubbs & Co., Cleveland, Lake Superior iron ore merchants. Mr. Runyon was appointed first secretary of the Lake Superior Iron Ore association and later became secretary as well of the Bessemer Pig Iron association. In 1896, Runyon, Stubbs &

B. T. BECHTEL

Whose death Feb. 1 was noted in the Feb. 7 issue of IRON TRADE REVIEW

Co. purchased the Struthers blast furnace. Mr. Stubbs died about a score of years ago. Mr. Runyon was then president of the Struthers Furnace Co., which rebuilt and modernized the stack. He continued to operate it until a few years ago when it went into bankruptcy, since which time Mr. Runyon has been living a retired life at Scarsdale. He is survived by two sons, Walter Clark and Robert Edward Runyon, and a daughter, Mrs. William F. Hart.

* * *

Peter Broadbooks, 88, machine tool designer and inventor, and holder of many valuable patents, passed away at his home in Batavia, N. Y., recently.

* * *

William S. Bumbaugh, president of the Monessen Foundry & Machine Co., Monessen, Pa., which he founded in 1898, died Feb. 8 at his home in Belle Vernon, Pa., after an extended illness.

* * *

Stephen H. Clulee, 70, director of the Mossberg Pressed Steel Co., Attleboro, Mass., and former head of the Bay State Optical Co., died at Boston last Week.

* * *

Edward S. Perot, former president of the National Conduit & Cable Co., died at his home in New York. He organized the company many years ago and retired as president in 1918.

* * *

Harry S. Birch, 52, secretary and treasurer of the Elizabeth Cornice Works Inc., Elizabeth, N. J., died Feb. 7. Mr. Birch was president of the Union County Savings bank of Elizabeth, and had numerous other interests.

* * *

W. W. Wainwright, 74, Connersville, Ind., founder of the Wainwright Engineering Corp., which later was merged with the McQuay Norris Co., died recently after a long illness. Mr. Wainwright retired from active business some time ago and since that time had devoted his time to scientific and historical research.

* * *

Harvey A. Call, of the research department of the Copper and Brass Research association, New York, died Feb. 8 in that city. A few months after joining the staff of the association late in 1926, he was placed in charge of its mid-western office in St. Louis but returned to New York about a year ago. He had been for many years editor and treasurer of *Sanitary and Heating Engineering.*

* * *

Samuel Deutsch, 63, founder of the Ohio Iron & Metal Co., Chicago and Cleveland, 45 years ago and until 12 years ago its president, died Feb. 7 at Chicago after an illness of several months. He was one of the best known pioneer iron and steel scrap dealers, a director of the Inland Steel Co., president of the Associated Jewish Charities and a former president of the Standard club, all of Chicago.

National Electric Products Co., Pittsburgh, has leased 21,000 square feet in the new Wolf terminal, Philadelphia.

Here and There in Industry

Timely Information Which Records Developments in Various Lines of Productive Enterprise

SCHAUER MACHINE CO., Cincinnati, has been organized and has bought the assets of the Neil & Smith Electric Tool Co. L. Lee Schauer is president and treasurer. Manufacture of portable electric tools will be continued at the plant at 905 Broadway. Mr. Schauer has been associated with the Bickford Tool Co. and Lodge & Shipley Machine Tool Co., Cincinnati. W. J. Byrns is vice president and L. C. Christopher is secretary.

* * *

BRITISH PERLIT IRON CO. has removed its offices from 15, Victoria street, London, S.W. 1, to 9 Rumford street, Liverpool, Eng.

* * *

BROWN INSTRUMENT CO., Philadelphia, has moved its Buffalo office to 402 Marine Trust building, where larger facilities are available.

* * *

BUCYRUS-ERIE CO., has placed its plant in Erie, Pa., on double turn, having formed a night shift to increase production to keep pace with orders.

* * *

GENERAL ALLOYS CO., Boston, is installing an electric furnace for the manufacture of a nickel-chromium alloy for automotive and tractor use.

* * *

GENERAL STEEL WARES LTD. has taken over the equipment branch of Fletcher & McLaughlin Ltd., Toronto, Ont., manufacturer of soda fountains.

* * *

PRUYN BEARINGS CORP., 312 Massachusetts avenue, Cambridge, Mass., recently incorporated, will manufacture standard series of ball and roller bearings and special devices.

* * *

COGSDILL MFG. CO., Detroit, a partnership for 12 years, manufacturing a general line of metal-cutting tools, has incorporated under the same name. S. A. Cogsdill is president.

* * *

NATIONAL RIVET & MFG. CO., Milwaukee, has been incorporated to manufacture brass, copper, aluminum and steel rivets, solid, semi-tubular, tubular and split types. This company absorbs the U. S. Rivet & Mfg. Co., Mishawaka, Ind., and will add to its equipment. P. H. Dorr has been elected president, and William Fleming Jr., secretary and treasurer. The plant is at the foot of Park place, Milwaukee.

* * *

ELECTRIC AUTO LITE CO. has taken over the storage battery division of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and is increasing its capacity threefold.

* * *

GLAMORGAN PIPE & FOUNDRY CO., Lynchburg, Va., has re-elected its officers, as follows: President, H. L. Campbell; vice president, W. R. Winfree; vice president, J. C. Dabney; secretary and treasurer, F. K. McVeigh.

* * *

BERNHARDT INC., Chicago, has been incorporated to manufacture metal products, including stamped, spun and cast, lighting fixtures and novelties. H. A. Barnhardt is president, B. B. Barnhardt treasurer, and Frederic F. Carothers secretary.

* * *

PHOENIX BRASS FITTINGS CORP., Irvington, N. J., has been organized to succeed the Phoenix Brass Foundry. The new corporation expects to improve plant facilities and add to its lines of brass products. No new buildings are contemplated.

* * *

WESTINGHOUSE ELECTRIC INTERNATIONAL CO. is making arrangements to have sales in France handled by the Westinghouse Electric Co. of France, recently organized with a Delaware charter. The company will have no manufacturing facilities in France.

* * *

AMERICAN WRINGER CO. INC., Woonsocket, R. I., has sold its hand clothes wringer department to the Lovell Mfg. Co., Erie, Pa., and this department will be moved to the latter plant. The power wringer division at the Woonsocket plant will be enlarged.

* * *

APOLLO STEEL CO., Apollo, Pa., producer of sheet steel, has voted to split up its $50 par value stock into $10 par value stock on the basis of five shares of new stock for one share of old. Rights will be issued to stockholders to buy one share of the new stock for each five shares held. Money received from the sale will be used in making additions and improvements and in providing additional working capital.

* * *

CANADIAN WESTINGHOUSE CO. has been awarded a contract for installation of a 62,000-horsepower generator for the Ontario hydro-power commission in the development at Queenstown and Chippewa, Ont. About 18 months will be required for completing the contract.

* * *

CUTLER-HAMMER INC., Milwaukee, has bought the business of the Trumbull Vanderpoel Electric Mfg. Co., Bantam, Conn., which will be operated as a subsidiary under its present name. The company manufactures a line of meter service and safety switches.

* * *

EATON BUMPER & SPRING CO., Cleveland, has bought from the Monmouth Products Co., Cleveland, its gasoline tank cap business, one of a number of production lines of the latter. The caps will be made at the East 140th street plant of the Eaton Co.

* * *

BELLEFONTAINE BRIDGE & STEEL CO., Bellefontaine, O., has elected John L. Longfellow chairman, John E. Miller president, Charles S. Hockett vice president, Curtis V. Smith secretary and treasurer, and B. A. Ice general manager. Directors include these officers and Oren Cutland and Dr. W. S. Phillips.

* * *

HAMILTON FOUNDRY & MACHINE CO., Hamilton, O., has elected officers, as follows: Chairman, Gordon S. Rentschler; president, P. E. Rentschler; vice president, D. McDaniel; and secretary and treasurer, H. A. Rentschler. Directors are Walter A. Rentschler, G. A. Rentschler and F. B. Rentschler.

* * *

SCOTT VALVE MFG. CO., Detroit, formerly the Roe Stephens Mfg. Co., has been reorganized and facilities for manufacture of valves have been enlarged. Alexander P. Gow is president, John A. Baas vice presi-

dent, A. DeLong Thomas secretary, and Guy C. Powell treasurer. Directors are W. F. Austin, John A. Baas, Alexander P. Gow, Guy C. Powell, A. DeLong Thomas and E. W. Thomas.

* * *

JEFFERSON IRON & FURNACE CO., Oak Hill, O., has elected J. P. Hughes president, Mostyn Jones vice president, and Joseph J. Jones general manager, secretary and treasurer. Directors elected are Lew Hughes, J. P. Hughes, Joseph J. Jones, Mostyn Jones and John Newton Davis.

* * *

AMERICAN PUDDLED IRON CO., Youngstown, O., has elected R. C. Steese president and treasurer, John W. Ford vice president, and J. P. Sutter secretary and assistant treasurer. Directors are R. C. Steese, John W. Ford, John Tod, John Stambaugh II, T. M. Phillips, Fred Tod and Henry Jones, of Youngstown; Harry Jones, Canton, O.; and Frank B. Richards, Cleveland.

* * *

EDWARD A. WALSH, Milwaukee, is financing for commercial production a die casting machine developed by M. O. Held, Milwaukee. The industrial committee of the Milwaukee Association of Commerce has made a favorable report on the machine after test by several industries. The machine is said to cast parts much as a linotype machine casts slugs. Great speed of casting is claimed.

* * *

HOMESTEAD AIRCRAFT INC. has been organized and has leased factory buildings at McClure street and Third avenue, Homestead, Pa., where it will engage in the manufacture of a monoplane to be sold under $1000. Officers are: President, G. W. Murphy; vice president, G. A. Schryver; secretary, L. S. Anderson; and treasurer, Earl C. Dean.

* * *

WELLMAN - SEAVER - MORGAN Co., Cleveland, has appointed Lawrence N. B. Bullock, Edificio Oliver, 16 De Septiembre No. 5, Mexico, D. F., its sales representative in Mexico for mining machinery and other equipment. Mr. Bullock has had much experience in selling during his long residence in Mexico.

* * *

PITTSBURGH & WEST VIRGINIA RAILROAD will build a rail and river terminal between Dravosburg and Clairton, Pa. Barges will ferry cars from the railroad to various plants for loading or unloading, avoiding delays in congested switching yards. A similar service has been maintained for two years by the Jones & Laughlin Steel Corp. between its plants at Pittsburgh and Aliquippa, Pa.

* * *

T J. HOLMES CO., Boston, has purchased the Freeman-Daughaday Jewelry Co. factory at Norton, Mass., and will install new machinery for the manufacture of atomizers. The Boston organization will be moved to Norton and operations will start about March 15.

* * *

FREYN ENGINEERING CO., Chicago, has booked an order from the Continental Steel Corp. for a fire tube waste heat boiler for its plant at Kokomo, Ind. This is the fifth waste heat boiler of Freyn design at this plant. The Freyn company also has been retained by the American Rolling Mill Co. to remodel its Norton furnace at Ashland, Ky. The Freyn company has acquired the American rights to the Siemens continuous regenerative furnace for reheating billets and slabs.

* * *

FEDERAL STEEL CORP., Detroit, has moved into its new warehouse and office building adjoining its old warehouse, now having 75,000 square feet of floor space. The warehouse is heated to 60 degrees in freezing weather. It is served by two overhead electric cranes of 15 tons capacity each, with 77-foot span, assuring rapid handling of material. The warehouse has been equipped with additional shears, strippers and shipping equipment. Leo H. Marks is manager of sales.

* * *

OTIS ELEVATOR CO. is developing a unit at Buffalo, N. Y., which will be in operation in a few weeks. From Buffalo headquarters it will serve most of New York state, eastern Ohio, western Pennsylvania, western Maryland and West Virginia. Offices will be maintained at Albany, Rochester, Syracuse and other New York cities, Erie and Pittsburgh, Pa., Huntington, W. Va., and Cleveland. George Martens will be general manager of the unit, L. E. Kimball sales engineer, R. H. Cunat accountant, E. J. Stafford construction manager, and Thomas F. McKean Jr. service manager.

* * *

GENERAL WELDER CO., 95 Steiner avenue, Akron, O., has been incorporated to build special butt, spot and seam welding machines for mass production. Standard machines will not be manufactured for the present. Byron T. Mottinger, formerly with the Federal Machine & Welder Co., Warren, O., as special engineer, is president and general manager. Paul C. Zars, treasurer, is a graduate at Berlin in electrical and mechanical engineering and for several years was chief engineer for the Deutsch Sweissenmachenen Fabrik, Dusseldorf. Recently he has been research engineer for the Taylor-Winfield Co., Warren, O. Arthur S. Mottinger is secretary and legal advisor. The company will develop its special flash welders.

* * *

CONANT MACHINE & STEEL CO., Concord, Mass., a partnership, has been incorporated with a Massachusetts charter and will continue the fabrication of loading and conveying machinery.

* * *

MONARCH DERRICK CO. is the new name of the steel derrick division of McGraw-Bearly Lumber Co., Tulsa, Okla., manufacturer of oil drilling and pumping derricks. B. E. Sanders is manager.

* * *

SPICER MFG. CO., manufacturer of automotive specialties, has moved its executive offices from South Plainfield, N. J., to Toledo, O., to be near the automotive center. Plants at South Plainfield, N. J., and Pottstown, Pa., will be continued in operation.

* * *

WESTERN CANADA STRUCTURAL STEEL & BRIDGE CO. LTD. is being formed at Vancouver, B. C., to take over the structural steel and shipbuilding plant of J. Coughlin & Son Ltd., False Creek. A syndicate of capitalists from eastern Canada has been formed to organize the new company, which will build a modern structural steel plant to replace the present shipbuilding plant. James Richardson, Winnipeg; Frank M. Ross, Montreal, and W. B. Champ, Hamilton, Ont., represent the eastern interests. J. P. Mackenzie has been made general sales manager.

Discovers New Ore

E. A. Bruce, Silver City, N. Mex., has discovered a body of ore near Silver City which is said to contain uranium, vanadium and another unclassified element. When used as a welding component, iron and copper can be welded without any trace of a joint, it is said. Preparations are being made to develop the deposit.

The receiver of the Marnall Steel Products Co. Inc., Jamaica, Long Island, N. Y., has been discharged and the bankruptcy petition in connection with this company dismissed.

Machinery

Active Buying Causes Deliveries to Be Deferred—New England Makers Plan Plant Extensions—Western Railroads Inquire

PRACTICALLY all classes of machine tool users are seeking further equipment. Railroads in the West are putting out lists to a considerable total. Used equipment of late design is in demand at good prices since deliveries of new tools are delayed by full order books of builders. In some cases delays of several weeks are faced by users who need tools at once to meet their manufacturing programs. General Electric Co. and R. Hoe & Co. continue the largest buyers. Airplane motor building is expanding and need for tools in that field is becoming an appreciable factor. Indications point to a larger sale of machine tools this year than in 1928. Prices are steady and tend higher under heavy ordering by all classes of machine tool equipment users.

New York, Feb. 12.—Brisk demand for machine tools continues, with prospects for active trading for several weeks to come. The General Electric Co., Schenectady, N. Y., continues the most active buyer, closing not only on tool room equipment and production machinery for its refrigerator department, but also on equipment for its various other divisions. This company is expected to be an even heavier buyer of equipment this year than in 1928. Among recent purchases is approximately $40,000 of presses for its refrigerator department. Recent inquiries include a 6-foot radial drill, a tool and cutter grinder, a universal grinder and a cylindrical grinder.

R. Hoe & Co., this city, noted in last week's issue as closing on several lathes, purchased 16 production lathes and two heavy turret lathes. A prospective buyer of fabricating equipment is the Pennsylvania railroad, which will build a boiler shop in the East, requiring 1800 tons of structural steel. Lycoming Mfg. Co., Williamsport, Pa., is compiling data on considerable equipment to be used in the manufacture of an air-cooled airplane engine.

A substantial list of miscellaneous machine tools has been issued by International Cement Co. for installation in Havana, Cuba. International Motors Co., out of the market for considerable time, has closed on two of three tools, and will make further substantial purchases over the next few weeks. The equipment will be for the Plainfield, N. J., and New Brunswick, N. J., plants.

American Cirrus Engines Inc., Belleville, N. J., has recently purchased a milling machine and a small precision tool and is expected to buy further equipment shortly. The company, recently organized, has purchased the plant of the Kelsey Motor Co. at Belleville, N. J., but whether it will job out the production of its engine, which is an English airplane engine, and do only the assembling at Belleville, or build the engine itself is not clear at this time. Elevator Supplies Inc., Hoboken, N. J., has recently purchased a boring machine and several engine lathes and milling machines. Eclipse Engine Co., East Orange, N. J., manufacturer of starters for airplane engines, is negotiating for equipment.

Spicer Mfg. Co. is buying a few tools for Pottsville, Pa. Report is current here that the Buick Motor Car Co. has closed on five special production lathes with a Cincinnati builder at about $150,000 for delivery in six months.

Chicgo, Feb. 12.—Machine tool buying again is picking up. Extended deliveries are adding to sales problems of distributors and extend to all heavy lines. Several additional railroad lists have come out, including further inquiries from Santa Fe for $45,000 to $50,000 worth of equipment. Santa Fe list includes a 14 x 24 heavy duty lathe, 24-inch shaper, combination punch and shear, a 6-foot, 5-foot and two 3-foot radial drills, eight 3 x 24 dry grinders, a 4-inch twist drill grinder, one 2-inch and two 4-inch pipe threading machines, two 4 x 34 heavy duty turret lathes, a 2-inch double and a 2-inch single head bolt cutter, an 8 x 24-inch surface grinder, and two 32-inch crank shapers. Chicago, Milwaukee, St. Paul & Pacific is inquiring for 10 lathes, and the Burlington is asking bids on a broaching machine and other tools. Several large individual purchases featured the market during the week, those including a 36-inch planer and other heavy duty tools. The general sales volume now is at about the rate of January.

Worcester, Mass., Feb. 12.—Machine tool activity continues brisk with New England makers. While in spots there has been some recession in buying, orders already booked keep plants at a high rate of production. Deliveries in some instances are being advanced. Demand for machinery comes from a widely diversified range of industry. Grinding machinery makers are busy. One firm sold several special internal grinders to an automotive interest this week. Lathes of all types and milling machinery lead in demand. Radio, metalworking shops, airplane and woodworking machinery are active. Used tools are moving better at firmer prices, but there is decided weakness in demand for more obsolete tools. Part makers are rushed. Machine shop trade is satisfactory. February has opened without much apparent decline in the brisk pace. Production tools are in strong demand. Price tendency is upward and many makers are sold well ahead. Several machine tool makers are considering building expansion early in the year.

Pittsburgh, Feb. 12.—Despite the fact that machinery purchases usually are restricted to a few tools at a time, sellers are receiving a steady flow of orders. Inquiry is termed brisk, and prospective work is in substantial volume. The crane market is active and several pending jobs are expected to be closed soon.

Cleveland, Feb. 12.—While dull spots appear here and there in the machine tool market the general trend shows improvement. Large lists still are lacking but buying of individual units has a wider spread particularly those designed for high production and automatic work. Prompt shipment still is demanded both for new and used tools. Industrial buying has undergone no change since a week ago. Sales made to this class of the trade still are of a spot character.

CRANE ORDERS PLACED

Sixteen 40-ton locomotive cranes for Amtorg Trading Corp., 165 Broadway, New York, for shipment to Russia, to Industrial-Brown Hoist Corp.; this contract was placed about Jan. 1 but has only just been made public; these are in addition to ten 40-ton locomotive cranes placed and noted at the time.

Two gasoline crawler cranes for Mecaro Co., 105 Court street, Brooklyn, N. Y., subway contractor, one going to Northwest Engineering Co. and one to Koehring Mfg. Co.

Two crawler cranes for J. P. White, Passaic, N. J., one going to Link-Belt Corp. and the other to Bucyrus & Erie Co.

Among single orders are: One used gasoline crawler crane for Slattery-Daino Co., subway contractor, New York, to unnamed seller; used gasoline crawler for Wolverine Portland Cement Co., Cold Water, Mich., to an unnamed seller* used gasoline crawler crane for Ebner Sons Co., Springfield, O., to an unnamed seller; 1-yard crawler crane and 1-yard crawler shovel for Triest Construction Co., 247 Park avenue, New York, subway contractor, to Koehring Mfg. Co.; 5-ton, 1-motor crane, 30-foot, 7-inch span, for North Jersey Foundry Co., Little Falls, N. J., to Box Crane & Hoist Corp.; 3-ton, 2-motor crane, 26-foot span, for Buckingham Steel Co., Brooklyn, to Box Crane & Hoist Co.

Four electric overhead cranes for the Warners N. J., plant of American Cynamid Co., 535 Fifth avenue, New York, to Harnischfeger Corp.; specifications call for one 10-ton, 29-foot span; one 6-ton, 75-foot span; and two 8-ton cranes, 97-foot span.

CRANE ORDERS PENDING

Twenty-five 8-ton crawler cranes for Pennsylvania railroad, contemplated.

Page-Hersey Year Record

Toronto, Ont., Feb. 12.—The annual report of the Page-Hersey Tube Co. Ltd. for 1928 shows net profit after depreciation, taxes, etc., of $1,720,731. Operating profit was $1,616,152. Net surplus for the year was $1,180,449. Last year was the most successful in the history of the company.

CONSTRUCTION and ENTERPRISE

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East Central

BELLEVILLE, ILL.—Baker Stove Co., 905 Freeburg avenue, advises that it has awarded the general contract for the construction of a 2-story plant to W. I. Guymon.

CHICAGO—Scoville Mfg. Co., 1229 West Washington street, producer of brass goods, will enlarge a 4-story warehouse on a part of its ground in order to increase the working capacity of the plant.

CHICAGO—Barnes Metal Products Co. has purchased the property at Kilbourn avenue and Sixteenth street, improved by a 1-story modern building. The company manufactures steel, copper and tin products.

CICERO, ILL.—Chicago Extruded Metals Co. has purchased 152,000 square feet of land at Sixteenth street and Fifty-fourth avenue, directly opposite the present plant buildings. Extensions will nearly double the present capacity.

KANKAKEE, ILL.—E. Z. Est Way Stove Works, subsidiary of Sears, Roebuck & Co., Arthington and Homan streets, Chicago, has awarded the general contract for the construction of a 1-story enameling plant to Austin Co., 510 North Dearborn street, Chicago.

OAK PARK, ILL.—Johnston Automobile, Wagon & Machine Co., 110 Harlem avenue, M. S. Dutton manager, plans the construction of a 2-story auto repair shop addition and alterations.

QUINCY, ILL.—Otis Elevator Co., Eleventh avenue and Twenty-sixth street, plans the construction of a 1-story foundry addition.

ANDERSON, IND.—Van Loon Pattern Works plans the construction of a manufacturing plant, 50 x 150 feet at 1670 Ohio avenue.

FT. WAYNE, IND.—City of Ft. Wayne, department of public works, city hall, closed bids Feb. 12 on the construction of electric light and power station No. 2, a 1-story structure.

MUNCIE, IND.—Muncie Gear Works, W. A. Spurgeon president, contemplates the construction of a 1-story plant addition.

PORTLAND, IND.—Fire damaged the Portland Forge & Foundry works here. Some machinery and motors were saved. Repairs will be made immediately.

RICHMOND, IND.—Davis Aircraft Corp., organized with a capital of $150,000, has purchased the Vulcan Aircraft Co., Portsmouth, O. Machinery and equipment will be transferred to this city.

SOUTH BEND, IND.—South Bend Tool & Die Co., formed recently, has started work on the construction of a manufacturing plant, to be equipped with new machinery, including large planers, jig-boring units, etc.

DEARBORN, MICH.—Ford Motor Co., Fordson, Mich., has let the structural steel contract for a foundry building to Whitehead & Kales Co.

DETROIT—Structural steel for the Chandler street substation for the Detroit Edison Co., 2000 Second street, has been awarded to the American Bridge Co. (Noted Feb. 7.)

DETROIT—Warner Aircraft Corp. is having plans prepared for the construction of an office and manufacturing plant, including test buildings and power house. Plans will be ready for bids in March.

DETROIT—Concrete reinforcing bar contract for the heat treating plant of the American Gear Mfg. Co., 1342 East Canfield street, has been let to Truscon Steel Co. (Noted Jan. 24.)

DETROIT—Gorham Tool Co., 2206 Twelfth street, has awarded the contract for structural steel for a plant addition to Mahon Structural Steel Co., through Martin-Krausman Co., general contractor. (Noted Jan. 24.)

MUSKEGON HEIGHTS, MICH.—Pyle Pattern & Mfg. Corp. advises that it has awarded the contract for the construction of a plant, 2-story, 50 x 125 feet, to George Lather & Sons.

WYANDOTTE, MICH.—All Metal Products Co., 1167 Sycamore street, contemplates the erection of a manufacturing plant. Plans will be ready for bids about April 1.

AKRON, O.—General Welder Co., 95 Steiner avenue, incorporated recently with $100,000 capital, advises that it has its plant, a fully equipped machine shop, also a pattern works, bronze copper and grey iron foundry in connection. It will manufacture special welding machines, and contemplates the manufacture of standard machines.

CLEVELAND—Thompson Products Inc., 2196 Clarkwood road, plans a $1,000,000 expansion program, including the construction of two new buildings in Detroit. The company also plans a 4-story addition to its present plant here.

DELPHOS, O.—Gramm Motors Inc. advises that it expects to build a 2-story plant addition, 45 x 200 feet, in the spring. The contract has not been awarded yet.

OAK HARBOR, O.—Village of Oak Harbor, L. L. Carstensen mayor, contemplates the construction of a power plant.

HUNTINGTON, W. VA.—A. F. Thompson Mfg. Co. plans the construction of a manufacturing plant addition, containing 26,000 square feet of floor space, to increase its output of stoves and burners.

WHEELING, W. VA.—Extruded Metal Products Co., Joseph Hillard, president, plans to start construction of a new foundry, April 1.

BELOIT, WIS.—Wisconsin Power & Light Co., 16 North Carroll street, Madison, Wis., has appropriated $199,500 as follows for power plant extensions at Beloit, Wis.; House, 3-story, 42 x 65 feet; coal bunker and ash pit for 10,000-square foot heating surface boiler; generating equipment. E. J. Kallevang, Madison, is chief engineer; A. P. Gale is district manager at Beloit.

MADISON, WIS.—Arthur Peabody, state architect, expects to have plans ready Feb. 25 for the new mechanical engineering building of the University of Wisconsin, for which an appropriation of $577,000 is available. M. E. McCaffrey, Madison, is secretary of the board of regents.

MILWAUKEE—Milwaukee Electric Railway & Light Co. plans to enlarge its Lakeside steam generating plant during 1929. The boiler house will be extended by the construction of an addition 92 x 95 feet. A 40,000-horsepower boiler will be installed as the chief item in the expansion program.

OSHKOSH, WIS.—Wisconsin Parts Co., manufacturing heavy duty axles and double reduction gears for trucks, busses, railway coaches, etc., and recently merged with the Timken-Detroit Axle Co., is preparing to build a large addition to its plant at 571 High street. Work will start about March 15. W. F. Rockwell is president.

PRAIRIE DU CHIEN, WIS.—One new prime mover, two new boilers and resetting

Resale News

SAMUEL T. Freeman & Co., Philadelphia, will sell at auction at Nassau, N. Y., Feb. 19, the real estate, machinery and equipment of the Kosegarten Piano Action Mfg. Co. Inc.

Sales Calendar

Feb. 15—Receiver's sale of coal land and equipment of Consolidated Coke Co., Uniontown, Pa.

Feb. 15—Receiver's sale of plant of McMyler-Interstate Co., Bedford, O.

Feb. 19—Auction sale of real estate, machinery and equipment of Kosegarten Piano Action Co. Inc., at Nassau, N. Y.

Feb. 25—Bids opened on operating plants of Puget Sound Electric Co., Tacoma, Wash.

one present boiler are important parts of a power system improvement being handled for the Prairie du Chien Woolen Mills by the engineering firm of Charles A. Cahill & Sons, 214 Mason street, Milwaukee. Frank H. Poehler is president of the mills.

WEST MILWAUKEE, WIS.—Chicago, Milwaukee, St. Paul & Pacific railroad, Union Station, Chicago, contemplates the construction of a car shop addition here.

Southern States

BESSEMER, ALA.—Contract for the construction of car shops for the Pullman Car & Mfg. Co., Pullman building, Chicago, has been awarded to United Engineers & Constructors Inc., Philadelphia. (Noted Jan. 31.)

GADSDEN, ALA.—Goodyear Tire & Rubber Co., Akron, O., has let the contract for structural steel for a power house to be built here to McClintic-Marshall Co.

NORTH BIRMINGHAM, ALA.—Alabama Boiler & Construction Co., Seventh avenue and Thirteenth street, incorporated recently, has its plant and contemplates purchasing additional equipment. (Noted Jan. 31.)

MIAMI, FLA.—William Elliott plans the construction of a plant here for the manufacture of gasoline stove appliances.

BLAKELY, GA.—Public Utilities Co. of Georgia, J. E. Simmons manager, Camilia, Ga., plans the construction of a power building. Plans are by E. S. Killebrew, engineer, Albany.

SHREVEPORT, LA.—Eureka Oil & Gas Co. has purchased gas properties from E. R. Ratcliff and associates in West Louisiana and East Texas fields and plans an extensive development program.

WINNFIELD, LA.—City of Winnfield is preparing plans for construction of a water works and power plant. Swanson-McGraw Inc., Balter building, New Orleans, is consulting engineer

CLARKSDALE, MISS.—Clarksdale Machinery Co., J. H. Hooks manager, plans the erection of a building to be a machinery department. The work will triple the space of the company's quarters.

PASCAGOULA, MISS.—City soon will award the contract for the construction of waterworks improvements, including wells, pumps, etc.

OKLAHOMA CITY, OKLA.—W. B. Atkins, president Atkins Service Co., operating machine and boiler repair shops in Seminole oil field, plans to operate a similar shop adjacent to new Oklahoma City oil field.

TULSA, OKLA.—Unit Lock Co. announces removal of plant from Sapulpa, Okla., to Tulsa where plant facilities will be expanded and builders hardware will be manufactured in addition to padlocks. A. G. Williams is vice president and general manager.

CAMDEN, S. C.—City council has acquired 160-acre site for a municipal airport and will erect a hangar and reconditioning shop, and other mechanical units.

CUERO, TEX.—Fire damaged the machine shop of the Cuero Cotton Oil Mfg. Co.

DALLAS, TEX.—Superior Foundry, 3115 Main street, Mr. Rinnessan manager, was recently damaged by fire.

DALLAS, TEX.—Dallas Armature Corp. has increased capital stock from $10,000 to $25,000 to provide for plant expansion.

EL PASO, TEX.—El Paso Electric Co., E. J. Gannon general manager, plans to spend $3,000,000 during 1929 on increasing its generating capacity.

HOUSTON, TEX.—H. G. J. Frank, 2801 Harrisburg boulevard, has acquired several lots adjacent to present plant and will expand a plant for rebuilding of automobiles.

HOUSTON, TEX.—Reed Roller Bit Co. has let the contract for the construction of a 1-story warehouse to Houston Structural Steel Co., 3910 Washington street. (Noted Feb. 7.)

JACKSONVILLE, TEX.—Gulf Public Service Co. will spend $300,000 on improvements inculding new turbine and boiler equipment, transmission line extensions, etc.

ODESSA, TEX.—Chamber of commerce, Edward J. Wall manager, plans the establishment of an airport, to be equipped with steel hangar, shops, etc.

SWEETWATER, TEX.—Gulf Refining Co. has acquired site for an oil refinery, planned to be 5000 barrels initial daily capacity. Charles Stevens company purchasing agent, is in charge of buying equipment and materials.

North Atlantic

BRIDGEPORT, CONN.—Wright & Corson Mfg. Co., manufacturer of airplanes and automobile parts, has purchased a 10-acre site at Milford, Conn., for the erection of a plant. When completed the company will move its factory from Bridgeport. Fletcher Thompson Co., Bridgeport, architect and engineer, is in charge of the new construction.

HARTFORD, CONN.—Hartford Special Machinery Co., 287 Homestead avenue, plans the construction of a 1 and 2-story plant and office building addition. Buck & Sheldon Inc., 60 Prospect street, are making plans.

BALTIMORE—Berliner-Joyce Aircraft Corp., incorporated with $1,000,000 capital by W. W. Moss, has acquired a site adjacent to the municipal airport where it will start work immediately on an airplane manufacturing plant to contain 50,000 square feet of floor space. Equipment will be moved here from its plant in Alexandria, Va.

CENTRAL PARK, MD.—University of Maryland plans the construction of a central heating plant.

BOSTON—Edison Electric Illuminating Co., 39 Boylston street, has let the contract for the construction of a transformer building at Allston district to W. M. Bailey Co., 88 Broad street.

GREAT BARRINGTON, MASS.—Standley Insulating Co., manufacturer of vacuum bottles and other products, plans to double the capacity of its plant. New automatic welding equipment will be installed.

WORCESTER, MASS.—Worcester Polytechnic institute, Ralph Earle president, plans the erection of a new mechanical engineering building.

WORCESTER, MASS.—Boston & Maine railroad plans to expand terminal facilities here, construction including an engine terminal, an addition to the present roundhouse, additional engine stalls, ash handling and sanding equipment, etc.

BLOOMFIELD, N. J.—Westinghouse Lamp Co., Clearfield avenue, has let the general contract for the construction of a 3-story, 40 x 120-foot addition to its plant, to Salmond & Scrimshaw, 526 Elm street, Arlington, N. J.

CAMDEN, N. J.—Rundle Mfg. Co., Twenty-seventh avenue and Wahl street, Milwaukee, plans the construction of six buildings here, including a power house, cleaning building, foundry, shipping department, mill and locker building and enameling building. A. A. Wickland & Co., Chicago, prepared the plans.

LONG BRANCH, N. J.—Long Branch Power & Light Co. has awarded the contract for the construction of a power plant to E. Schoenthaler, 252 Long Branch avenue.

MONTVILLE, N. J.—Jersey Central Power & Light Co., 20 South street, Morristown, N. J., plans the construction of a gas generating station here.

TRENTON, N. J.—State house commission plans the construction of a central power plant at the state office building, East State street. H. Kelly, 219 East Hanover street, is engineer.

PHILADELPHIA—Philadelphia International Harvester Co., 2905 North Sixteenth street, has let the contract for structural steel for a building to Bethlehem Construction Co.

Western States

ALAMOSA, COLO.—Marion Mining Co. plans the construction of two hydroelectric power plants on the Alamosa river.

DENVER—Bids will be received by the chief engineer, bureau of reclamation here, Feb. 26.

for furnishing one 1200 horsepower vertical hydraulic turbine; two 48-inch motor operated gate valves, current generator and other equipment for Pilot Butte power project, Wyoming. On Feb. 27 the same office will receive bids for furnishing two 72-inch riveted steel outlet pipes and accessories for the Echo dam project, Utah.

LAMAR, COLO.—City council, care of J. H. Myers, plans the construction of a 2000-kilowatt addition to the steam generating plant here. Wood & Weber, Midland Savings bank, Denver, are consulting engineers for the project.

OLYMPIA, WASH.—Inland Power & Light Co., Portland, Oreg., has made application to the state for water rights on the Lewis river with the idea of constructing a power project to develop ultimately 227,000 horsepower.

SEATTLE—Star Foundry Co. has leased a site at Horton street and Third avenue south from the Port of Seattle for a term of 30 years. The company is planning to move its plant from Youngstown to the new site.

SHELTON, WASH.—Rainier Pulp & Paper Co. plans installation of an auxiliary steam plant to be housed in a power room addition now under construction. A boiler of 1000 horsepower has been ordered, as well as other necessary equipment.

West Central

STORM LAKE, IOWA—Surveys have been made on property on which the Iowa Public Service Co. plans the construction of a new electric power plant.

WICHITA, KANS.—Municipal airport plans construction of hangars and other buildings. R. A. Finney, Topeka, is consulting engineer.

WICHITA, KANS.—Coleman Lamp & Stove Co. will build a 4-story addition, 60 x 160 feet, and has awarded the general contract to John Denny of Wichita.

WICHITA, KANS.—Industrial Machine Work Co., Ponca City, Okla., has moved to Wichita where it has taken a lease on a 1-story building. The company specializes in repair work on oil field machinery.

ANGLUM, MO.—Oscar Johnson is receiving bids on the construction of a hangar.

LICKING, MO.—W. R. Fisher Inc., Boatman's Bank building, St. Louis, contemplates the construction of a hydroelectric dam on the Piney river near here, to furnish power for Texas towns.

NORTH KANSAS CITY, MO.—Baldwin Harvester Co., 1801 McGee, Kansas City, Mo., H. T. O'Maley president, contemplates the construction of a 1-story manufacturing plant.

ST. LOUIS—A. Fiss Co., manufacturer of auto accessories, has leased a 2-story building at 3434 Lindell boulevard and will move its plant to new location.

ST. LOUIS—Union Electric Light & Power Co., Louis H. Egan president, has announced improvements during 1919, major projects including a 75,000-kilowatt generator for the Cahokia plant and new transmission lines.

FERGUS FALLS, N. DAK.—Enlargement is planned for the Otter Tail Power Co. The plans include enlargement of the power plant to house an additional 7000-horsepower steam boiler and turbine, etc.

GRAFTON, N. DAK.—Plans and specifications for a new power plant were submitted to city council here. Action on the move to enlarge the plant and erect the new building, was delayed.

Canada

WINNIPEG, MAN.—Service Station Equipment Co. Ltd., Toronto, Ont., manufacturer of gasoline pumps, tanks, etc., has awarded contract to Carter-Halls-Aldinger Co. Ltd., Royal Bank building, Winnipeg, for the erection of a manufacturing plant at the corner of Winnipeg and Phillips streets, to be 1-story, 100 x 275 feet.

EAP FALLS, ONT.—Hydro Electric Power Commission of Ontario, University avenue, Toronto, Ont., plans the construction of a power house here on the English river.

FORD, ONT.—Servel Corp. Ltd., 51 East Forty-second street, New York, has awarded contract to the Hoffman Construction Co., for the erection of a factory on Metcalfe street here. The latter has in turn let a number of sub-trades.

GEORGETOWN, ONT.—Smith & Stone Ltd., manufacturer of electrical equipment, plans a plant addition here.

HAMILTON, ONT.—The Pigott Construction Co., 813 Pigott building, has been awarded contract for the construction of a transformer station and assembly plant on Myler street for the Canadian Westinghouse Co. Ltd., Sanford avenue. Building to be 1-story, 87 x 290 feet. B. F. & H. Prack, 1131 Pigott building, are the architects.

HAMILTON, ONT.—National Steel Car Corp. has let contract to Parklap Ltd., 541 Ouellette avenue, Windsor, Ont., for the erection of an addition to its coach plant here, to be 1-story, 90 x 100 feet. The steel contract was awarded to the Hamilton Bridge Co. The company proposes to spend $1,750,000 on improvements to its local works. (Noted Jan. 24.)

LEASIDE, ONT.—John G. Kent & Son Ltd., 1150 Bay street, Toronto, Ont., have been awarded contract by the Shipway Iron Co., 700 Wellington street, west, Toronto, for the erection of a plant on Laird drive and Malcolm road. E. A. Leigh, 1205 Bay street, Toronto, is architect. Building to be 1-story, 50 x 110 feet.

LISTOWEL, ONT.—Clark Metals Ltd., manufacturer of casters, furniture trimmings, automobile hardware, etc., has started work on a plant addition, which when completed and with equipment installed will double the capacity of its present works.

LONDON, ONT.—E. Leonard & Sons Ltd., manufacturers of engines and boilers, are building an addition to their plant here, and will purchase a 20 to 25-ton 45 to 50-foot span, traveling crane. The company also proposes building an addition to its boiler plant soon.

NIAGARA FALLS, ONT.—Bids will be called about Feb. 15 by the Niagara Falls Water commission for the erection of a filtration plant and power house in Queen Victoria Park, Dufferin Islands. Plans being completed by F. A. Dallyn, 71 King street west, Toronto, Ont.

PORT COLBORNE, ONT.—Fraser-Brace Ltd., 105 Craig street, west, Montreal, Que., has contract for the erection of a refinery here for the International Nickel Co. Building to be 2-story, 75 x 200 feet. The company also plans large extensions to its plants at Copper Cliffs, Ont., for which steel has been placed with the Dominion Bridge Co., Toronto, Ont.

PORT HOPE, ONT.—Matthews Conveyor Co., John street, manufacturer of carriers, chutes, etc., will call for bids about March 1, for the erection of a plant addition.

PRESTON, ONT.—Eastern Steel Products Ltd., manufacturer of steel trusses, for barns, etc., is building a plant addition, 48 x 140 feet.

ST. THOMAS, ONT.—J. T. Finlad, architect, 430 Talbot street, is receiving bids for the erection of an addition to the plant of the St. Thomas Metal Signs Ltd.

TORONTO, ONT.—Dominion Radiator & Boiler Co. Ltd. is remodeling its Toronto plant.

TORONTO, ONT.—J. & J. Taylor Ltd., manufacturer of safes, etc., has started work on a plant addition.

TORONTO, ONT.—Prest-O-Lite Storage Battery Co. Ltd., proposes to build a large plant addition this year.

TORONTO, ONT.—Exide Batteries of Canada Ltd., proposes to start work at an early date on a plant addition here.

TORONTO, ONT.—Canadian Rogers Sheet Metal & Roofing Co. plans a large addition to its plant here and the installation of considerable new machinery and tools, according to E. G. Rogers, manager.

TORONTO, ONT.—Day Name Plates Ltd., 4 Woodfield road, will have plans prepared by Chapman & Oxley, Sterling Tower building, for the erection of a plant. Work will not go ahead until next spring or summer.

TORONTO, ONT.—Rogers Batteryless Radio Co., Chestnut street, has let contract to the Russell Construction Co. Ltd., Harbor Commissioners building, for the erection of a plant on Fleet street. Revised plans call for a 2-story building, 82 x 250 feet. (Noted Feb. 7.)

WALKERVILLE, ONT.—H. Walker & Sons Metal Products Ltd., Kildare road, has started work on an addition to its plant.

WALKERVILLE, ONT.—Chrysler Corp. is preparing to build another unit in connection with its proposed $5,000,000 building program

here. The first unit costing $1,500,000 is nearing completion and installation of machinery will start about March 1. (Noted Jan. 17.)

WINDSOR, ONT.—L. A. Young Industries of Canada Ltd., manufacturer of wire products, etc., is contemplating building a large addition to its plant this year.

QUEBEC, QUE.—Noranda Mines Ltd. plans the organization of a new company, and plans the construction of a customs copper refinery in Eastern Canada.

SOULANGES COUNTY, QUE.—La cie d' Entreprises Publiques Ltee, 72 Mountain Hill, Quebec, Que., are having plans prepared by C. Camille Lessard, for a waterworks system.

Recent Incorporations

CHICAGO—Artcrest Mfg. Co., 4246 North Western avenue, has been incorporated with $30,000 capital to manufacture and deal in wrought iron novelties, etc., by Hart Lipman.

CHICAGO—Motovigor Inc., 3201 West Fifty-ninth street, has been incorporated with 1000 shares no par value to manufacture and deal in vibrating machines, etc., by Thomas G. Deering, M. C. Bird and E. Boniwell.

CHICAGO—American Vending Corp., 120 South La Salle street, has been incorporated with $50,000 capital to manufacture and operate vending machines, by G. C. Ransom, L. F. Davies and C. W. Snyder.

INDIANAPOLIS—Miami-Holliday Steel Co. has been incorporated with $30,000 capital and 40,600 shares no par value stock to fabricate and deal in iron, steel, manganese, etc., by J. S. Holliday.

BOSTON—S. R. Hazelton Mfg. Co. has been incorporated with 1000 shares no par value stock to manufacture metal products for coal dealers, etc., by Julius C. Santis, 28 Jackson Terrace, Newton, Mass.

BOSTON—W. B. Hubbard & Sons Co. has been incorporated with $100,000 capital and 1000 shares no par value stock to manufacture and deal in plumbers' and steam fitters' supplies by Frank W. Hubbard, 176 Oliver street, Boston.

CAMBRIDGE, MASS.—Mann Instrument Co. has been incorporated with $15,000 capital and 500 shares no par value stock to manufacture precision instruments and devices, by David W. Mann, Lincoln, Mass.

FALL RIVER, MASS.—William McLeod Inc. has been incorporated with $10,000 capital to manufacture machines, tools, etc., for the spinning of cotton and woolen fabrics, by William M. McCaskie, 144 Mt. Pleasant street, New Bedford, Mass.

WORCESTER, MASS.—Aulenback Tool Co. has been incorporated with 900 shares no par value stock by James H. Aulenback, Linwood M. Erskine and Thomas M. Bray, all of Worcester.

ST. LOUIS—Superior Stoker Corp. has been incorporated with $50,000 capital by J. B. Marquis, 6341 Southward street.

ST. LOUIS—Eagle Laundry Machinery Co., 11 South Second street, has been incorporated with $50,000 capital by David Cohen.

BROOKLYN, N. Y.—Goodway Metal Specialties Corp. has been incorporated by H. Turin, 225 Broadway, New York, attorney.

BROOKLYN, N. Y.—Brooklyn Auto Rim Wheel & Spring Corp. has been incorporated with $10,000 capital by J. Bergman, 170 Broadway, attorney.

BROOKLYN, N. Y.—Universal Melting & Smelting Corp. has been incorporated with $125,000 capital by L. Horwitz, 815 Broadway, attorney.

HUNTINGTON, N. Y.—George W. Bush & Sons have been incorporated with $200,000 capital to manufacture and deal in farming implements by Adserly & Niles, Northport, N. Y., attorneys.

NEW YORK—Preferred Electric & Wire Corp. has been incorporated with $20,000 capital by Lippman & Sachs, 285 Madison avenue, attorneys.

NEW YORK—American Automatic Train Control Co. has been incorporated with $25,000 in preferred stock and 100 shares no par value stock to manufacture and deal in safety devices by G. Hoerner, 220 West Forty-second street, attorney.

TULSA, OKLA.—Protective Metals has been incorporated with $100,000 capital by C. F. Camp, 221 East Archer street, W. E. Caudish and G. S. Manatt.

TULSA, OKLA.—Standard Steel Barrel Co. has been incorporated with $50,000 capital by Morse Garrett, 915 Palace building; Mary Monaghan and Laura Ellis.

TULSA, OKLA.—Gilmore Engineering Co. has been incorporated with $50,000 capital by Forest E. Gilmore, Carl Gilmore and Mona Dickens to specialize in oil field power plant construction.

TULSA, OKLA.—Tulsa Orifice Valve Mfg. Co. has been incorporated with $15,000 capital by H. M. Lundquist, Tuloma building, L. S. Allen and Joe Sanders to manufacture and distribute oil field equipment specialties. For the time being manufacturing will be done under contract and no plant investment is contemplated.

SAN ANTONIO, TEX.—F. C. Boech Machine Works, capital $10,000, has been incorporated by George Potchernick, F. C. Boech and C. Kuehne to operate general machine shop. F. C. Boech is manager.

MILWAUKEE—A charter has been granted to the American Grinder & Specialty Co., capital stock $10,000, licensed to manufacture and sell grinders, tools, etc. Incorporators are George H. Ische, 1642 Third street; Sol T. Cohen, and Sly Bockshe, all of Milwaukee.

CALGARY, ALTA.—Precision Machinery & Foundry Ltd. has been incorporated to carry on the business as iron founder, mechanical engineer and manufacturer of machinery, tools, etc., with $250,000 capital by Percy L. Sandford, Alexander Hannah, Edward J. Chambers, all of Calgary.

KENORA, ONT.—Anderson Boat Co. has been incorporated to manufacture and deal in motor boats, launches, airplanes, etc., with $100,000 capital by Gusstaf U. Anderson, Earle C. Popham, Melvin Seegmiller, and others, all of Kenora.

OTTAWA, ONT.—Dominion International Equipments Ltd. has been incorporated to manufacture and deal in railway signal and other devices and equipment, with a capital stock of 100,000 shares of no par value, by Aubrey H. Elder, Edward S. McDougall, of Quebec City, Kenneth Archibald, of Montreal, and others.

New Trade Publications

DRILLS—Morse Twist Drill & Machine Co., New Bedford, Mass., has issued a leaflet featuring a new drill it has developed for use on manganese steel. Improvement in performance since the first drill for manganese steel is illustrated.

RIVETING—Hanna Engineering Works, Chicago, manufacturer of riveting machinery, has issued a bulletin calling attention to advantages of riveting in fabrication of steel and describing some of the equipment made by the company.

ROTARY BLOWERS—Connersville Blower Co., Connersville, Ind., in a current bulletin lists a number of processes to which its rotary positive blowers have been adapted. Tables of capacities are given for belt and motor drive.

STEEL BRIDGES—American Institute of Steel Construction, New York, has prepared for distribution a folder illustrating the beauty and utility of fabricated steel for bridge work, highway and ornamental.

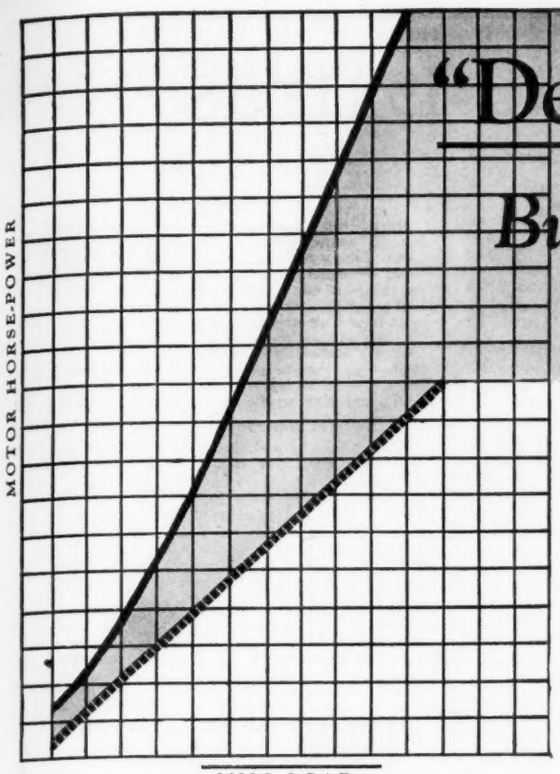
ROTARY GAS PUMPS—P. H. & F. M. Roots Co., Connersville, Ind., has issued a bulletin on its high-pressure type of rotary gas pumps. It includes tabulated data on pressures, capacities and horsepower, a review of various types of pumping units and a two-page construction drawing showing a typical unit in detail.

LEAD COATING—Wheeling Metal & Mfg. Co., Wheeling, W. Va., has issued a booklet on its lead-coated steel sheets as protection against changes incident to age and time. The material is described and its advantages presented. Illustrations show structures protected by its use. Various forms into which it is fabricated for general and special uses are shown.

SEVENTY-FIVE YEARS—Frick Co. Inc., Waynesboro, Pa., manufacturer of machinery for three-quarters of a century, celebrates that anniversary by publishing a booklet covering the history of the company. A history of mechanical refrigeration is given and a picture story of the development of Frick refrigerating equipment.

POWDERED FUEL—Combustion Engineering Corp., New York, is distributing a reprint of a paper on powdered fuel in metallurgical work, by W. O. Renkin, which was presented before the World Power Conference in London, in 1928. The paper deals principally with the use of powdered coal in the iron and steel industry, touching on its use in some nonferrous metal work.

VALVE CONTROL—Cutler-Hammer Inc., Milwaukee, has issued the second edition of its booklet, "Modern Valve Control Practice." Additional information and data not included in the first edition are made available. New photographs show the use and installation of motor-driven valves, grouped by applications, graphically demonstrating the service rendered in power plants, water works, gas plants and similar industrial applications. The automatic valve control system of Cutler-Hammer design is explained in detail. A new unit for small valves is included.



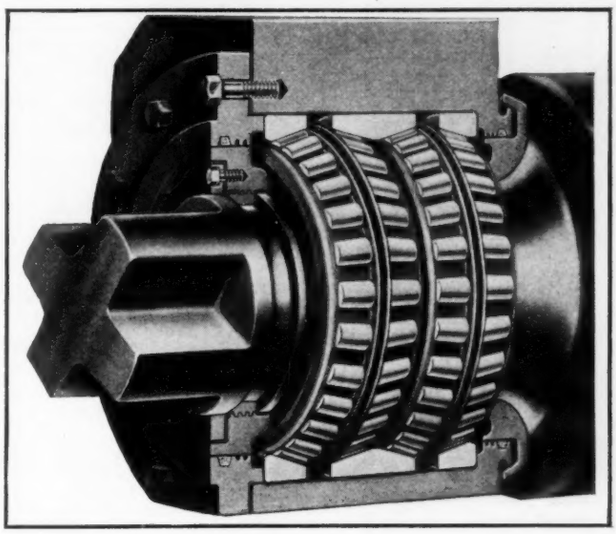
PLAIN BEARING ..... TIMKEN BEARING
COMPARATIVE MOTOR HORSE-POWERS (ACTUAL RATING) FOR ROLLING MILLS

"Dead" Horse-Power

Buried in High Motor ratings

saved by

TIMKEN
Tapered
ROLLER BEARINGS



What percentage of your mill motor ratings represents *"dead"* horse-power killed in overcoming high friction load?

Why carry *"dead"* horse-power which costs money and is unnecessary?

Use the modern way—Timken Bearings on the roll necks, gear drives and pinion stands. Reduce running torque requirements. Select motors of lower horse-power rating—*"live"* horse-power—devoted to work and not killed by friction.

Decide on Timken Bearings because of their exclusive Timken tapered construction, Timken *POSITIVELY ALIGNED ROLLS* and Timken electric steel, which make them manifestly more than anti-friction.

Heavy loads, radial or thrust, are capably carried. Delays and shutdowns caused by bearing troubles can be forgotten. Lubrication expense is cut 50%. Maintenance costs are reduced to an absolute minimum. The life of the bearings is prolonged. An installation of Timken Bearings in roll necks has paid for itself in 9¾ months and paid 123% on the investment the first year. Clear your mill of *"dead"* horse-power with Timken Bearings and reap the benefits.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

Discounts and Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	60	48½

Lap Weld

2-inch	53	41½
2½ to 6-inch	57	45½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½

Lap Weld

2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG

Butt Weld

½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½

Lap Weld

2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

(Note—Large jobbers obtain additional preferential discounts of 1 and 5 on black and 1½ and 5 on galvanized. Extra 5 per cent granted in the 4th quarter 1927 and 1st quarter 1928 discontinued April 2, 1928.)

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLING

Butt Weld

	Black	Galv.
¼ and ⅜-inch	+11	+36
½-inch	23	5
¾-inch	28	11
1 and 1¼-inch	31	15
1½ and 2-inch	35	18

Lap Weld

1¼ and 1½-inch	Upon application	
2-inch	23	9
2½ to 3½-inch	28	12
4 to 6-inch	30	17
7 and 8-inch	29	16
9 to 12-inch	26	11

REAMED AND DRIFTED

2-inch to 6-inch—Two points less than above

EXTRA STRONG, PLAIN ENDS

¼ and ⅜-inch	+13	+48
½-inch	23	7
¾-inch	28	12
1 to 2-inch	34	18

Lap Weld

2-inch	29	13
2½ to 4-inch	34	20
4½ to 6-inch	33	19
7 and 8-inch	31	17
9 to 12-inch	21	8

DOUBLE EXTRA STRONG

Butt Weld

½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½-inch	+13	+25
3 and 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	.....

(Note—Large jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized.)

Boiler Tubes

Pittsburgh carload discounts

STEEL (Lap Weld)

2 and 2¼-inch	40 off
2½ and 2¾-inch	48 off
3-inch	54 off
3¼ to 3¾-inch	56 off
4-inch	59 off
4½ to 6-inch	48 off

Subject to two 5 per cent discounts on full carload shipments. On less than 10,000 pounds, base discount reduced 6 points and one 5 per cent allowed. On 10,000 pounds to carload, base discount reduced 4 points and two 5 per cents allowed.

CHARCOAL IRON

1½-inch	1 off
1¾-inch	8 off
2 and 2¼-inch	13 off
2½ and 2¾-inch	16 off
3-inch	17 off
3¼ to 3½-inch	18 off
4-inch	20 off
4½-inch	21 off

Subject to 10 per cent discount on full carload lots. On less than 10,000 pounds, base discount reduced 2 points and no preferential allowed. On 10,000 pounds to carload, 5 per cent preferential allowed.

SEAMLESS COLD DRAWN

1-inch	63 off
1¼ and 1½-inch	55 off
1¾-inch	39 off
2 and 2¼-inch	34 off
2½ and 2¾-inch	42 off
3-inch	48 off
3¼ and 3½-inch	50 off
4-inch	53 off
4½, 5 and 6-inch	42 off

SEAMLESS HOT ROLLED

1¾-inch	39 off
2 and 2½-inch	40 off
2½ and 2¾-inch	48 off
3-inch	54 off
3¼ and 3½-inch	56 off
4-inch	59 off
4½, 5 and 6-inch	48 off

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed.

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.30 per cent.....50 to 55 off
Carbon 0.30 to 0.40 per cent.....45 to 50 off

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Outside diameter	Net prices per foot f.o.b. Pittsburgh Gage	Price
21-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅜-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, date Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weight.

Over 100 to and including 110 inches	.05c
Over 110 to and including 115 inches	.10c
Over 115 to and including 120 inches	.15c
Over 120 to and including 125 inches	.25c
Over 125 to and including 128 inches	.50c
Plates less than ¼-inch or lighter than 11 pounds per square foot.	
Over 72 to and including 84 inches	.10c
Over 84 to and including 96 inches	.20c
Over 96 to and including 100 inches	.30c
Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.	

GAGE

Plates Not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including $\frac{7}{32}$-inch; or lighter than 10.2 pounds per square foot, to and including 7.65 pounds square foot.....	.20c

Plates Over 72 Inches Wide

Plates less than ¼-inch gage, to and including $\frac{7}{32}$-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds square foot....	.20c
Plates ordered 7.65 pounds square foot	.30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull materials subject to U. S. Navy Dept. specifications for medium or soft steel	.10c
High tensile hull steel subject to U. S. navy department or equivalent specifications	1.00c
Boiler steel subject to U. S. navy department specifications, classes A-B	1.50c
Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.	

Floor Plates

Checkered plates	1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection .....No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet	No extra
Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts. (Including straight taper plates)

Additional extra ..... .10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with re-entrant angles)

Additional extra ..... .20c

P & H Model 700 Shovel being used in heavy quarry service. This 1¼ yd. shovel can load as high as 1000 tons of stone per day.

—Put Teeth In It

It requires parts that can "take it on the chin" and still stand up to lick successfully such tough jobs as the P & H Shovel is asked to do.

To meet such tough requirements Sivyer Physical and Chemical Laboratories have developed a complete line of alloy steel castings—steel castings to meet virtually every type of strain or wear.

Day after day tests in the field prove the effectiveness of Sivyer Alloy Steels in consistently meeting requirements where unusual strength and durability must be had.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

"Where-To-Buy"

A classified by-products list of advertisers for the convenience of readers. If you don't find what you want, write us and we will tell you where to get it. ¶Index to advertisements will give you page number of any advertisers and by referring to advertisement you can get full particulars about products.

ABRASIVES (Polishing)
Carborundum Co., The, Niagara Falls, N. Y.
Norton Co., Worcester, Mass.

ACCUMULATORS
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

ACETYLENE (Dissolved)
Air Reduction Sales Co., 342 Madison Ave., New York City.
International Oxygen Co., Newark, N. J.
Prest-O-Lite Co., The, 30 E. 42nd St., New York City.

ACETYLENE GENERATORS
Air Reduction Sales Co., 342 Madison Ave., New York City.
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

ACETYLENE IN CYLINDERS
Air Reduction Sales Co., 342 Madison Ave., New York City.
International Oxygen Co., Newark, N. J.
Prest-O-Lite Co., The, 30 E. 42nd St., New York City.

ACIDS (Pickling)
American Chemical Paint Co., Ambler, Pa.

ADAMITE ROLLS
American Adamite Co., The, 410 Oliver Bldg., Pittsburgh, Pa.

AIR COMPRESSORS—See COMPRESSORS (Air)

ALLOYS
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Metal & Thermit Corp., 120 Broadway, New York City.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
Vanadium Corp. of America, 120 Broadway, New York City.

ALUMINUM
Aluminum Co. of America, 2408 Oliver Bldg., Pittsburgh, Pa.
Summerill Tubing Co., Bridgeport, Pa.

ALUMINUM (Vanadium)
Vanadium Corp. of America, 120 Broadway, New York City.

ALUMINUM BRONZE (Acid Resisting)
Duriron Co., Inc., The, Dayton, Ohio.

ANGLES, TEES, CHANNELS—See STEEL (Structural)

ANNEALING BOXES
Farrell-Cheek Steel Foundry Co., Sandusky, O.
Petroleum Iron Works Co., The, Sharon, Pa.
Smith, George H., Steel Casting Co., Milwaukee, Wis.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.
United Engineering & Foundry Co., Farmers Bk. Bldg., Pittsburgh.

ANVILS (Cast Steel)
West Steel Casting Co., 805 E. 70th St., Cleveland, O.

APPRAISALS
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.

ARCHES (Suspended)
Detrick, M. H., Co., 140 S. Dearborn St., Chicago, Ill.

ARCHITECTS (Industrial)
Austin Co., The, 16112 Euclid Ave., Cleveland, O.

AXLES
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Champion Machine & Forging Co., 3675 E. 78th St., Cleveland.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.

BABBITT METAL
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Williams Alloy Products Co., The, Elyria, Ohio.

BALING PRESSES
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.

BANDS (Iron)
Bethlehem Steel Co., Bethlehem, Pa

BANDS AND HOOPS (Galvanized Strips)
Sharon Steel Hoop Co., Sharon, Pa.

BAR BENDERS
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.

BARGES (Steel)
American Bridge Co., 71 Broadway, New York City.

BARRELS (Steel)
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.

BARS (Alloy)
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.

BARS (Concrete Reinforcing)
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
Gulf States Steel Co., Brown-Marx Bldg., Birmingham, Ala.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Migret, Rene, 7 Boulevard DeFontaine, Charleroi, Belgium.
Nicetown Plate Washer Co., Inc., Juaniata & Clarissa Sts., Nicetown, Philadelphia, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago.

BARS (Iron)—See IRON (Bar)

BARS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Bliss & Laughlin, Inc., Harvey, Ill.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Pacific Coast Steel Co., Hunter-Dulin Bldg., San Francisco, Calif.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago.
Tennessee Coal, Iron & Railroad Co., 1351 Brown-Marx Bldg., Birmingham, Ala.
Timken Roller Bearing Co., The, Canton, O.
Youngstown Sheet & Tube Co., Youngstown, O.

BEAMS, CHANNELS, ANGLES, ETC.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Migret, Rene, 7 Boulevard DeFontaine, Charleroi, Belgium.
Phoenix Iron Co., The, 20 So. 15th, Philadelphia, Pa.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago.

BEARING METAL
Williams Alloy Products Co., The, Elyria, Ohio.

BEARINGS (Ball)
New Departure Mfg. Co., The, Bristol, Conn.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

BEARINGS (Journal)
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Hyatt Roller Bearing Co., Newark, N. J.
Timken Roller Bearing Co., The, Canton, O.
Williams Alloy Products Co., The, Elyria, Ohio.

BEARINGS (Motor)
Hyatt Roller Bearing Co., Newark, N. J.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

BEARINGS (Roller)
Hyatt Roller Bearing Co., Newark, N. J.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

BEARINGS (Tapered Roller)
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Thrust)
Norma-Hoffmann Bearings Corp., Stamford, Conn.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS AND BUSHINGS (Brass and Bronze)
Erie Bronze Co., 402 W. 19th St., Erie, Pa.
Williams Alloy Products Co., The, Elyria, Ohio.

BENCH LEGS (Steel)
Lupton's, David, Sons Co., 2225 Allegheny St., Philadelphia, Pa.

BENDING AND STRAIGHTENING MACHINES
Cleveland Punch & Shear Works Co., The, 3917 St. Clair Ave., Cleveland, O.
Hinman, D. A., & Co., Sandwich, Ill.
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Long & Allstatter Co., Hamilton, O.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.

BENZOL AND TOLUOL RECOVERY PLANTS
Koppers Construction Co., The, Union Trust Bldg., Pittsburgh, Pa.

BILLETS (Alloy and Carbon Steel)
Central Alloy Steel Corp., Massillon, O.
Hausman & Wimmer Co., The, Clark Bldg., Pittsburgh, Pa.
Washburn Wire Co., Phillipsdale, R. I.

BILLETS (Die Stock Steel)
Hausman & Wimmer Co., The, Clark Bldg., Pittsburgh, Pa.

BILLETS (Forging)
Bethlehem Steel Co., Bethlehem, Pa.
Central Alloy Steel Corp., Massillon, O.
Erie Forge Co., Erie, Pa.
Hausman & Wimmer Co., The, Clark Bldg., Pittsburgh, Pa.
Heppenstall Forge & Knife Co., 47th and Hatfield Sts., Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Wood, Alan, Iron & Steel Co., Widener Bldg., Philadelphia, Pa.

BILLETS (Forging, Alloy Steel)
Bethlehem Steel Co., Bethlehem, Pa.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above